RICOH UNIVERSITY
Learning ◆ Knowledge ◆ Performance

G165/G166/G167
G181/G183/G184
SERVICE MANUAL

003359MIU

LANIER RICOH SAVIN

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G165/G166/G167
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Ricoh Americas Corporation

LEGEND

PRODUCT CODE	COMPANY		
	LANIER	RICOH	SAVIN
G165	SP C220N	SP C220N	SP C220N
G166	SP C221N	SP C221N	SP C221N
G167	SP C222DN	SP C222DN	SP C222DN
G181	SP C220S	SP C220S	SP C220S
G183	SP C221SF	SP C221SF	SP C221SF
G184	SP C222SF	SP C222SF	SP C222SF

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G165/G166/G167/G181/G183/G184

TABLE OF CONTENTS

INSTALLATION

1. INSTALLATION 1-1

1.1 INSTALLATION REQUIREMENTS.....1-1

1.1.1 ENVIRONMENT 1-1

1.1.2 MACHINE LEVEL 1-1

1.1.3 MACHINE SPACE REQUIREMENT.....1-2

Printer Model.....1-2

MF Model 1-2

1.1.4 POWER REQUIREMENTS.....1-3

1.1.5 INSTALLATION PROCEDURE.....1-3

PREVENTIVE MAINTENANCE

2. PREVENTIVE MAINTENANCE 2-1

2.1 PREVENTIVE MAINTENANCE 2-1

2.1.1 USER REPLACEABLE ITEMS 2-1

REPLACEMENT AND ADJUSTMENT

3. REPLACEMENT AND ADJUSTMENT 3-1

3.1 BEFORE YOU START.....3-1

3.2 SPECIAL TOOLS.....3-2

3.3 EXTERIOR COVERS.....3-3

3.3.1 REAR COVER 3-3

3.3.2 OPERATION PANEL 3-4

3.3.3 RIGHT COVER 3-5

3.3.4 LEFT COVER 3-5

3.3.5 FRONT COVER UNIT 3-6

3.4 LASER OPTICS 3-7
3.4.1 CAUTION DECAL LOCATIONS 3-7
3.4.2 LASER OPTICS HOUSING UNIT 3-8
After replacing the laser optics housing unit 3-11
3.5 AIO CARTRIDGE 3-12
3.5.1 AIO CARTRIDGE (ALL IN ONE CARTRIDGE) 3-12
3.5.2 BLACK AIO MOTOR 3-12
3.5.3 COLOR AIO MOTOR 3-16
3.6 IMAGE TRANSFER 3-17
3.6.1 IMAGE TRANSFER BELT UNIT 3-17
After replacing the image transfer belt unit 3-18
3.6.2 ITB (IMAGE TRANSFER BELT) CLEANING UNIT 3-19
3.6.3 AGITATOR MOTOR 3-20
3.6.4 ITB (IMAGE TRANSFER BELT) CONTACT MOTOR 3-21
3.6.5 ITB (IMAGE TRANSFER BELT) CONTACT SENSOR 3-22
3.6.6 TM (TONER MARK) SENSOR BASE 3-23
3.6.7 WASTE TONER BOTTLE SET SENSOR 3-24
3.6.8 WASTE TONER OVERFLOW SENSOR 3-26
3.7 PAPER TRANSFER 3-27
3.7.1 TRANSFER UNIT 3-27
3.7.2 TRANSFER ROLLER 3-28
3.7.3 REGISTRATION ROLLER 3-30
Reassembling the registration roller unit 3-30
3.7.4 REGISTRATION SENSOR 3-31
3.7.5 REGISTRATION CLUTCH 3-32
3.8 IMAGE FUSING 3-33
3.8.1 FUSING UNIT 3-33
3.8.2 FUSING LAMP 3-34
When Reinstalling the Fusing Lamp 3-34
3.8.3 TRANSPORT/FUSING MOTOR 3-35
3.9 PAPER FEED 3-36
3.9.1 PAPER FEED CLUTCH 3-36
3.9.2 PAPER FEED ROLLER 3-37
3.9.3 SEPARATION PAD 3-38
3.9.4 PAPER END SENSOR 3-39
3.10 PAPER EXIT 3-40

3.10.1 PAPER EXIT ROLLER 3-40
When reinstalling the paper exit roller 3-41
3.10.2 PAPER EXIT SENSOR 3-42
3.11 ELECTRICAL COMPONENTS 3-43
3.11.1 CONTROLLER BOARD 3-43
GDI/ PCL Controller Board (Printer Model) 3-43
Main Controller Board (MF Model) 3-44
PDL Board (G184 only) 3-45
3.11.2 EGB (ENGINE BOARD) 3-46
Printer Model 3-46
MF Model 3-48
3.11.3 FCU (G183/G184 ONLY) 3-50
3.11.4 INTERLOCK SWITCHES 3-51
3.11.5 FUSING FAN MOTOR 3-52
3.11.6 LSU FAN MOTOR 3-53
3.11.7 ID CHIP BOARD 3-54
3.11.8 PSU 3-55
Fuse 3-56
3.11.9 HIGH VOLTAGE POWER SUPPLY BOARD 3-57
3.11.10 TEMPERATURE/HUMIDITY SENSOR 3-57
3.11.11 DUPLEX MOTOR (DUPLEX MODEL) 3-58
3.11.12 SPEAKER (G183/G184 ONLY) 3-59
3.11.13 EEPROM 3-60
Printer Model 3-60
MF Model 3-62
3.12 ADF 3-64
3.12.1 ADF UNIT 3-64
3.12.2 ORIGINAL TRAY 3-65
3.12.3 ADF FEED UNIT 3-66
3.12.4 ADF SEPARATION PAD 3-66
3.12.5 ADF FRONT COVER 3-67
3.12.6 ADF REAR COVER 3-67
3.12.7 ADF COVER 3-68
3.12.8 ADF MOTOR 3-69
3.12.9 ORIGINAL SET SENSOR 3-70
3.12.10 ADF COVER OPEN SENSOR 3-71

3.12.11 ADF FEED SENSOR 3-72
3.12.12 ADF DRIVE BOARD 3-73
3.13 SCANNER 3-74
3.13.1 SCANNER UNIT 3-74
3.13.2 SCANNER TOP COVER 3-76
3.13.3 SCANNER CARRIAGE UNIT 3-77
3.13.4 EXPOSURE LAMP 3-79
When reinstalling the exposure lamp 3-80
3.13.5 LAMP STABILIZER BOARD 3-81
3.13.6 SCANNER MOTOR 3-82

TROUBLESHOOTING

4. TROUBLESHOOTING 4-1
4.1 ERROR CODES 4-1
4.1.1 OVERVIEW 4-1
4.1.2 ERROR CODES LIST 4-1
4.2 SERVICE CALL CONDITIONS 4-5
4.2.1 SUMMARY 4-5
4.2.2 ENGINE SC 4-6
SC 1xx (Other Error) 4-6
SC 2xx (Laser Optics Error) 4-6
SC 3xx (Charge Error) 4-8
SC 4xx (Image Transfer and Transfer Error) 4-9
SC 5xx (Motor and Fusing Error) 4-11
SC 6xx (Communication and Other Error) 4-16
4.2.3 CONTROLLER SC 4-17
SC8xx 4-17
4.3 IMAGE PROBLEMS 4-19
4.3.1 OVERVIEW 4-19
4.3.2 IMAGE PROBLEM 4-19

SERVICE TABLES

5. SERVICE TABLES.....5-1

5.1 SERVICE PROGRAM.....5-1

5.1.1 OVERVIEW.....5-1

5.2 SMART ORGANIZING MONITOR (PRINTER MODEL) 5-2

5.2.1 OVERVIEW.....5-2

5.2.2 PRINTER DRIVER INSTALLATION (USB CONNECTION).....5-2

5.2.3 ENTERING THE PRINTER CONFIGURATION.....5-3

5.2.4 PRINTER CONFIGURATION MENU LIST 5-5

Paper Input.....5-6

Maintenance.....5-9

System 5-11

Network 1 5-14

Network 2 5-18

Network 3 5-21

Printer (PCL only).....5-24

SP Mode 1.....5-27

SP Mode 2.....5-29

5.3 SERVICE MENU (MF MODEL).....5-35

5.3.1 OVERVIEW.....5-35

5.3.2 MAINTENANCE MODE MENU.....5-36

Entering the Maintenance Mode Menu.....5-36

Selecting an Item.....5-36

Going into the Next Level/ Returning to the Previous Level 5-36

Exiting the Maintenance Mode Menu 5-36

Menu List.....5-36

5.3.3 FAX SERVICE TEST MENU.....5-48

Entering the Fax Service Test Menu 5-48

Selecting an Item.....5-48

Going into the Next Level/ Returning to the Previous Level 5-48

Exiting the Maintenance Mode Menu 5-48

Menu List.....5-48

5.4 FIRMWARE UPDATING 5-50

5.4.1 PRINTER MODEL 5-50

Controller Firmware.....5-50

Engine Firmware 5-53
5.4.2 MF MODEL 5-54
Checking the Machine Firmware Version 5-54
Updating the Controller Firmware 5-54
Updating the Engine Firmware 5-56
5.4.3 BOOT LOADER FIRMWARE 5-57

DETAILED DESCRIPTIONS SECTION

6. DETAILED DESCRIPTIONS SECTION 6-1
6.1 MACHINE OVERVIEW 6-1
6.1.1 COMPONENT LAYOUT 6-1
Engine 6-1
6.1.2 PAPER PATH 6-2
6.1.3 DRIVE LAYOUT 6-3
6.1.4 ELECTRICAL COMPONENT LAYOUT 6-5
Engine 6-5
6.1.5 BOARD STRUCTURE 6-8
Descriptions 6-8
6.1.6 PRINTING PROCESS 6-10
6.2 PROCESS CONTROL 6-12
6.2.1 OVERVIEW 6-12
6.2.2 PROCESS CONTROL FLOW 6-13
6.2.3 PROCESS CONTROL SELF-CHECK 6-14
6.3 LASER EXPOSURE 6-17
6.3.1 OVERVIEW 6-17
6.3.2 OPTICAL PATH 6-18
6.3.3 LD SAFETY SWITCH 6-19
6.3.4 MUSIC (MIRROR UNIT SKEW AND INTERVAL CORRECTION) 6-20
6.4 AIO (ALL IN ONE) CARTRIDGE 6-21
6.4.1 OVERVIEW 6-21
6.4.2 DRIVE 6-22
6.4.3 OPC CHARGE AND CLEANING 6-23
6.4.4 WASTE TONER COLLECTION FROM THE OPC 6-24
6.4.5 TONER MIXING AND TRANSPORT 6-25

6.4.6 DEVELOPMENT MECHANISM 6-26
6.4.7 TONER NEAR END AND END DETECTION 6-26
Toner Near End 6-26
Toner End 6-26
6.5 PAPER FEED 6-27
6.5.1 OVERVIEW 6-27
6.5.2 DRIVE AND PAPER END DETECTION 6-28
Paper Feed 6-28
Paper End Detection 6-28
6.5.3 TRAY LIFT 6-29
6.5.4 BY-PASS FEED 6-30
6.5.5 DUPLEX (G167/G183/G184 ONLY) 6-31
Drive 6-31
Duplex Operation 6-31
6.6 IMAGE TRANSFER 6-32
6.6.1 OVERVIEW 6-32
6.6.2 DRIVE AND TRANSFER BELT ROLLER BIAS 6-33
6.6.3 TRANSFER BELT CONTACT 6-34
6.6.4 ITB (IMAGE TRANSFER BELT) CLEANING UNIT 6-35
6.6.5 TRANSFER ROLLER OVERVIEW 6-36
6.6.6 PAPER TRANSFER AND DISCHARGE 6-37
Transfer Roller 6-37
Paper Transfer Bias 6-37
Discharge Plate 6-37
6.6.7 WASTE TONER COLLECTION 6-38
6.7 FUSING AND EXIT 6-39
6.7.1 OVERVIEW 6-39
6.7.2 DRIVE 6-40
Models without Duplex (G165/G166: Printer model, G181: MF model) 6-40
Models with Duplex (G167: Printer model, G183/G184 MF model) 6-40
6.7.3 PRESSURE RELEASE MECHANISM 6-41
6.7.4 TEMPERATURE CONTROL 6-41
Fusing unit related SC codes 6-43
Anti-Humidity Mode 6-43
Energy Saver 6-44

6.8 CONTROLLER.....6-45
6.8.1 OVERVIEW.....6-45
Controller: Printer model (G165/G166/G167).....6-45
Controller: MF model (G181/G183/G184).....6-48
6.9 ADF.....6-51
6.9.1 OVERVIEW.....6-51
6.9.2 PAPER PATH.....6-52
6.9.3 TIMING CHART.....6-53
Single page.....6-53
Multiple pages.....6-53
Feed out jam detection.....6-54
6.10 SCANNER.....6-55
6.10.1 OVERVIEW.....6-55
6.10.2 DRIVE.....6-56

SPECIFICATIONS

7. SPECIFICATIONS.....7-1
7.1 GENERAL SPECIFICATIONS.....7-1
7.1.1 PRINTER MODEL.....7-1
7.1.2 MF MODEL.....7-4
Engine.....7-4
Copier.....7-7
Scanner.....7-9
Fax.....7-10
7.1.3 OPTION.....7-11
Paper Feed Unit.....7-11
7.2 SUPPORTED PAPER SIZES.....7-12
7.3 MACHINE CONFIGURATION.....7-15
7.3.1 PRINTER MODEL (G165/G166/G167).....7-15
7.3.2 MF MODEL (G181/G183/G184).....7-15

INSTALLATION

PREVENTIVE MAINTENANCE

Paper Feed Unit TK1010 (G849)

REPLACEMENT AND ADJUSTMENT

TROUBLESHOOTING

SERVICE TABLES

DETAILED DESCRIPTIONS

SPECIFICATIONS

TAB POSITION 1

TAB POSITION 2

TAB POSITION 3

TAB POSITION 4

TAB POSITION 5

TAB POSITION 6

TAB POSITION 7

TAB POSITION 8

Read This First

Safety Notices

Important Safety Notices

Prevention of Physical Injury

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the printer power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. The printer drives some of its components when it completes the warm-up period. Be careful to keep hands away from the mechanical and electrical components as the printer starts operation.
5. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Be careful to avoid touching those components with your bare hands.

Health Safety Conditions

Toner is non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

Observance of Electrical Safety Standards

The printer and its peripherals must be serviced by a customer service representative who has completed the training course on those models.

Safety and Ecological Notes for Disposal

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, the maintenance unit which includes developer or the organic photoconductor in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.

⚠WARNING

- To prevent a fire or explosion, keep the machine away from flammable liquids, gases, and aerosols. A fire or an explosion might occur.

⚠CAUTION

- The Controller board on the MF model contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard batteries in accordance with the manufacturer's instructions and local regulations.

Laser Safety

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

⚠WARNING

- Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

⚠WARNING

WARNING:

Turn off the main switch before attempting any of the procedures in the Laser Optics Housing Unit section. Laser beams can seriously damage your eyes.

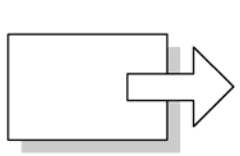
CAUTION MARKING:

3b_decals

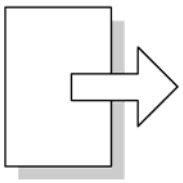
Symbols, Abbreviations and Trademarks

This manual uses several symbols and abbreviations. The meaning of those symbols and abbreviations are as follows:

☛	See or Refer to
	Clip ring
	Screw
	Connector
	Clamp
	E-ring
SEF	Short Edge Feed
LEF	Long Edge Feed



Short Edge Feed (SEF)



Long Edge Feed (LEF)

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INSTALLATION

1. INSTALLATION

1.1 INSTALLATION REQUIREMENTS

1.1.1 ENVIRONMENT

1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 2,000 lux (do not expose to direct sunlight)
4. Ventilation: 3 times/hr/person
5. Do not put the machine in areas that get sudden temperature changes. This includes:
   - Areas directly exposed to cool air from an air conditioner
   - Areas directly exposed to heat from a heater.
6. Do not put the machine in areas that get exposed to corrosive gas.
7. Do not install the machine at locations over 2,500 m (8,125 ft.) above sea level.
8. Put the machine on a strong, level base. (Inclination on any side must be no more than 5 mm.)
9. Do not put the machine in areas with strong vibrations.

1.1.2 MACHINE LEVEL

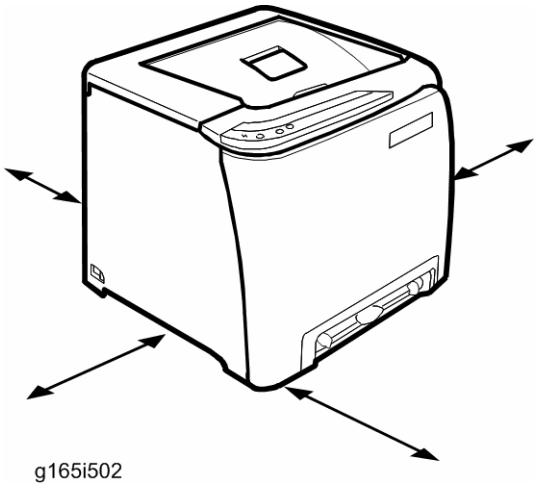
Front to back: Within 5 mm (0.2") of level

Right to left: Within 5 mm (0.2") of level

1.1.3 MACHINE SPACE REQUIREMENT

Put the machine near the power source with these clearances:

Printer Model



g165i502

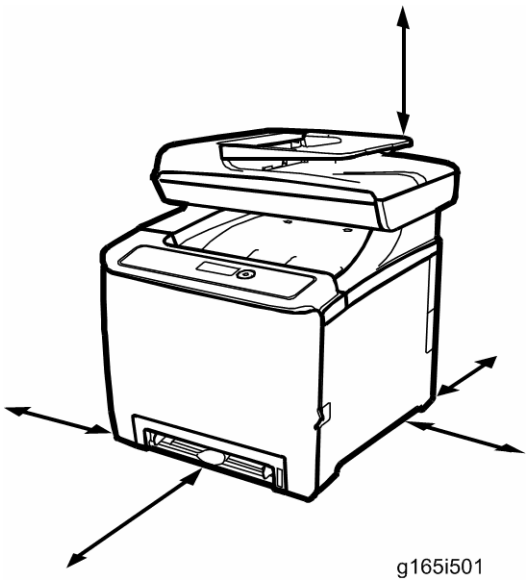
Left side: Over 20 cm (7.9")

Rear: Over 10 cm (4")

Right side: Over 10 cm (4")

Front: Over 70 cm (27.5")

MF Model



g165i501

Left side: Over 20 cm (7.9")

Rear: Over 20 cm (7.9")

Right side: Over 10 cm (4")

Front: Over 70 cm (27.5")

Top: Over 24 cm (9.5")

1.1.4 POWER REQUIREMENTS

⚠CAUTION

- Make sure that the plug is tightly in the outlet.
- Avoid multi-wiring.
- Make sure that you ground the machine.

Input voltage level	120 V, 60 Hz: More than 11 A (for North America) 220 V to 240 V, 50 Hz/60 Hz: More than 6 A (for Europe/ Asia)
Permitted voltage fluctuation: 10%	
Do not set anything on the power cord.	

1.1.5 INSTALLATION PROCEDURE

Refer to the Quick Installation Guide for details about installing the machine.

PREVENTIVE MAINTENANCE

2. PREVENTIVE MAINTENANCE

2.1 PREVENTIVE MAINTENANCE

2.1.1 USER REPLACEABLE ITEMS

Item	Yield
Print Cartridge (AIO)	Approx. 2 k prints/cartridge
Waste Toner Bottle	Approx. 25 k prints/bottle (See condition 4)

Condition:

1. An A4 (8.5"x11")/ 5% chart is used to measure the above yield.
2. The condition is standard temperature and humidity.
3. These yield values may change depending on the circumstances and printing conditions.
4. The Waste Toner Bottle's yield is measured when the printer is used 50% for color and 50% for black-and-white

REPLACEMENT & ADJUSTMENT

3. REPLACEMENT AND ADJUSTMENT

3.1 BEFORE YOU START

⚠CAUTION

- If there are printer jobs in the machine, print out all jobs in the printer buffer.
- Turn off the main power switch and unplug the machine before you do the procedures in this section.

3.2 SPECIAL TOOLS

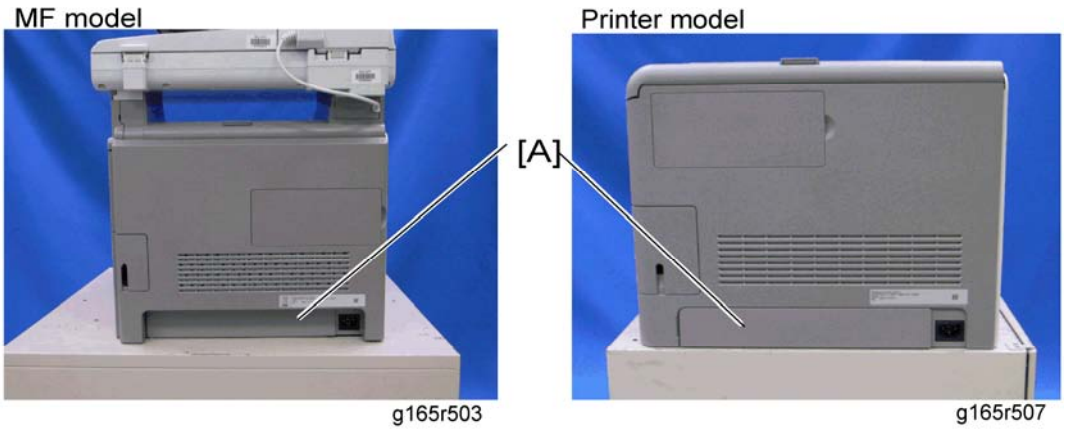
- PC: Windows 2000/XP/Vista, Windows Server 2003/2003 R2, or Mac OS X.
- USB cable or Crossover cable

3.3 EXTERIOR COVERS

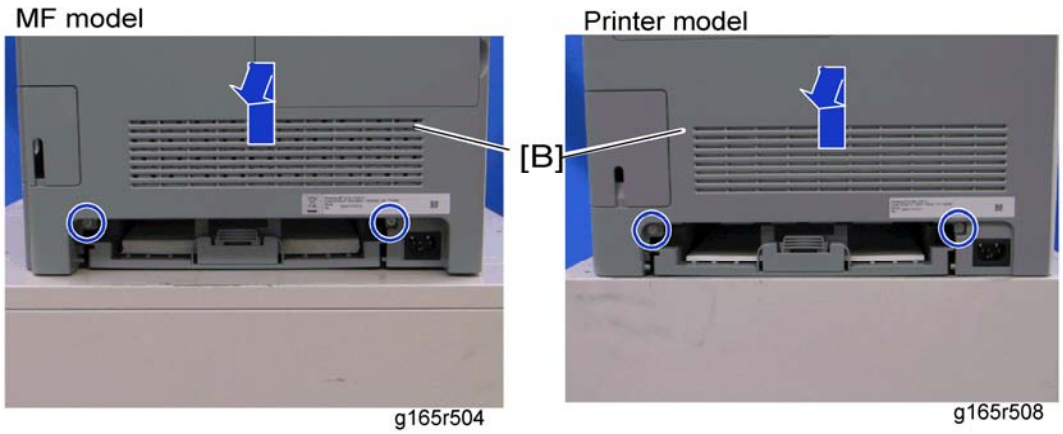
⚠CAUTION

- Turn off the main power switch and unplug the printer before you do the procedures in this section.

3.3.1 REAR COVER



1. Rear tray cover [A]



2. Rear cover [B] (🖉 x 2)

3.3.2 OPERATION PANEL

MF model

g165r512

[A]

Printer model

g165r513

1. Open the top cover [A].

MF model

g165r522

[C]

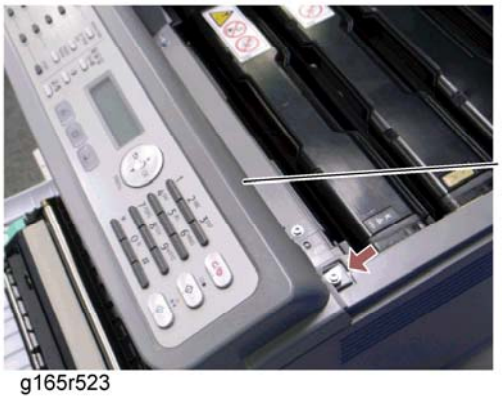
[B]

Printer model

g165r520

2. Open the front cover [B].
3. Front harness cover [C] (🔩 x 1)

MF model



g165r523

[D]

Printer model

g165r521

4. Operation panel [D] (🔩 x 1, ✋ x 1)

3.3.3 RIGHT COVER

1. Rear cover (☛ Rear Cover)
2. Operation panel (☛Operation Panel)

g165r524

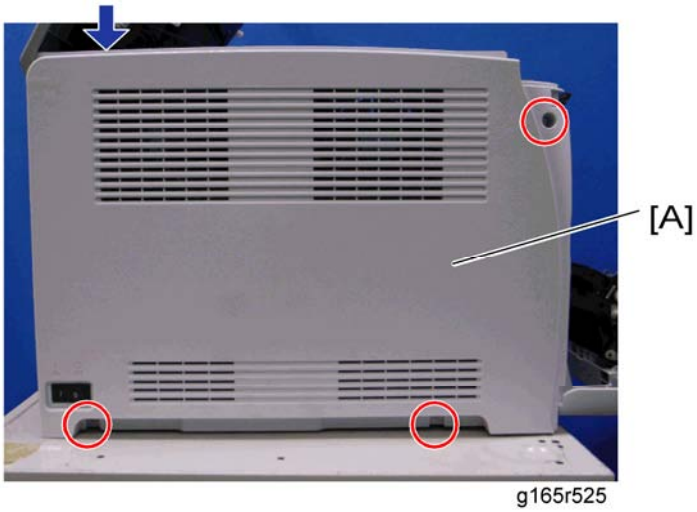
1. Right cover [A] (🔩 x 4)

Note

- Top front screw: M3x6, others: M4x6

3.3.4 LEFT COVER

1. Rear cover (☛ Rear Cover)
2. Operation panel (☛Operation Panel)



g165r525

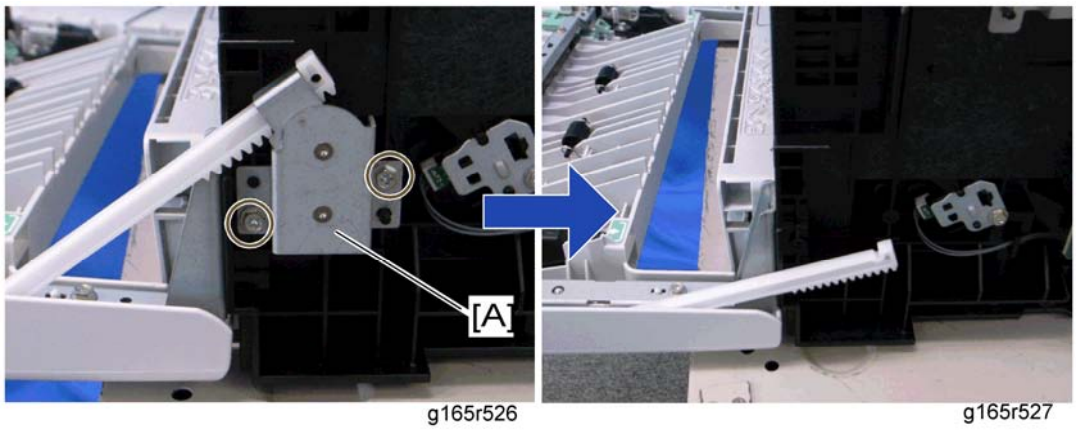
1. Left cover [A] (🔩 x 3, hook at arrow mark)

Note

- Top front screw: M3x6, others: M4x6

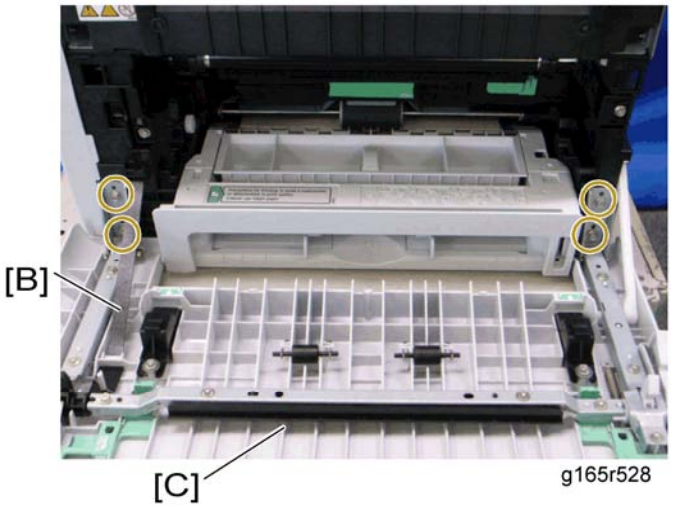
3.3.5 FRONT COVER UNIT

1. Rear cover (☛ Rear Cover)
2. Operation panel (☛ Operation Panel)
3. Transfer unit (☛Transfer Unit)
4. Right cover (☛ Right Cover)



g165r526 g165r527

5. Cover link gear unit [A] (🔩 x 2)



g165r528

6. Release the belt [B]
7. Front cover unit [C] (🔩 x 4)

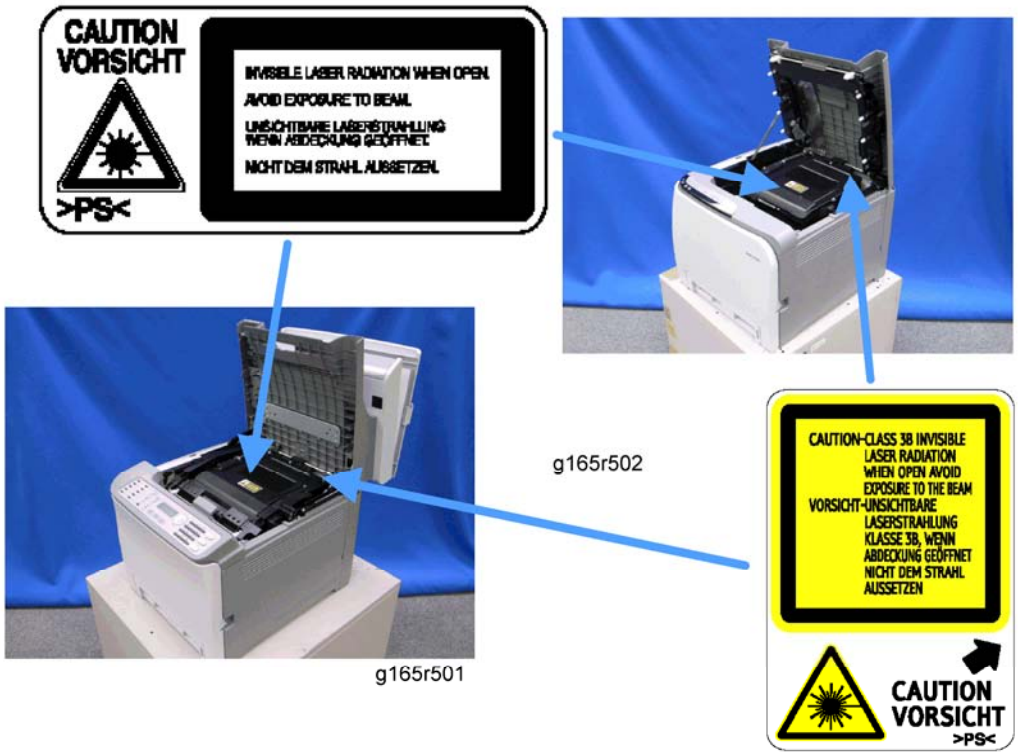
3.4 LASER OPTICS

⚠WARNING

- Turn off the main power switch and unplug the printer before beginning any of the procedures in this section. Laser beams can cause serious eye injury.

3.4.1 CAUTION DECAL LOCATIONS

Caution decals are attached as shown below.



g165r501

g165r502

⚠WARNING

- Be sure to turn off the main power switch and disconnect the power plug from the power outlet before beginning any disassembly or adjustment of the laser unit. This printer uses a class IIIb laser beam with a wavelength of 655 nm and an output of 7 mW. The laser can cause serious eye injury.

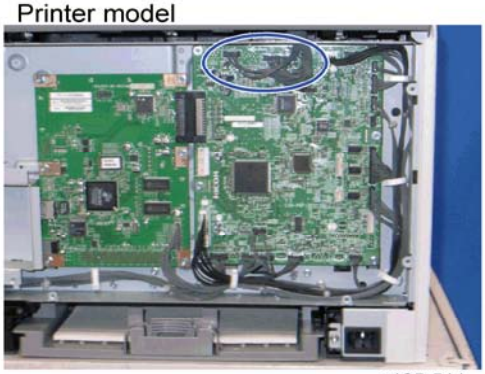
3.4.2 LASER OPTICS HOUSING UNIT

1. Rear cover (☛ Rear Cover)
2. Controller box cover (☛ Controller Board)
3. MF model only: Remove the controller bracket (☛ EGB)

MF model

g165r510

Printer model



g165r511

4. Disconnect the three harnesses from CN301, 302 and 303 on the EGB (☟ x 3).

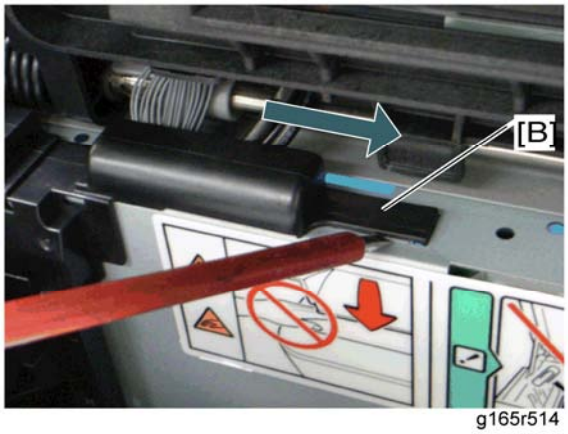
MF model

g165r512

Printer model

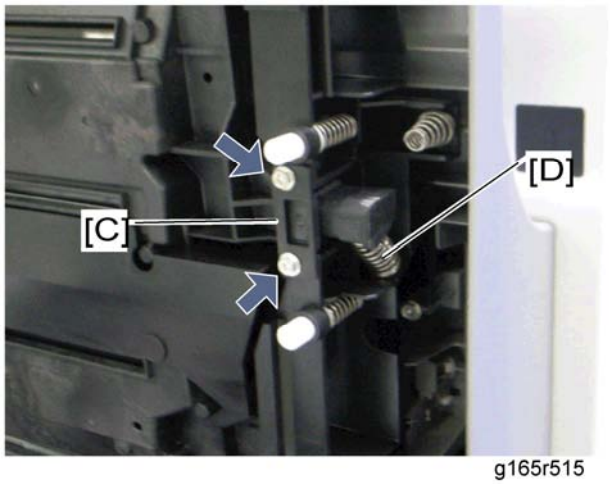
g165r513

5. Open the top cover [A].



g165r514

6. Lift up the hook [B] of the harness guide at the rear-left frame and slide the harness guide to the right.



g165r515

7. Stoppers [C] (🔩 x 2 each; left side and right side)
8. Remove the springs [D] (left side and right side).

g165r516

g165r517

9. Remove the laser optics housing unit [E] from the top cover and place it on the main body.

Note

- Always use two hands when carrying the laser optics housing unit. Be sure not to drop the laser optics housing unit.

g165r518

g165r517

10. Take out the harnesses [F] (☞ x 1).

g165r519

11. Remove the laser optics housing unit.

After replacing the laser optics housing unit

Important

- Do the following step 2 with the front cover of the machine open.

1. Open the front cover and turn on the machine.
2. Input the setting values for the laser optics housing unit.
   - Printer model: "LSU Adjustment" in the "SP Mode 2" tab
   - MF model: "LSU Adjustment" in the "Engine Maintenance" menu (MF model).

   The settings are on a sheet of paper that comes with the laser optics housing unit.
3. Close the front cover.
4. Execute "Color Registration" in the "SP Mode 2" tab (printer model) or the "Engine Maintenance" menu (MF model).
5. Adjust the registration settings for each tray and for the front and rear sides of the paper with the "SP Mode 2" tab (printer model) or the "Engine Maintenance" menu (MF model) if necessary.

3.5 AIO CARTRIDGE

3.5.1 AIO CARTRIDGE (ALL IN ONE CARTRIDGE)

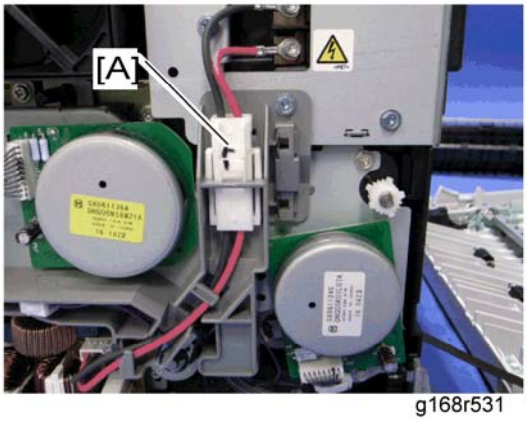
1. Open the top cover.

g168r568

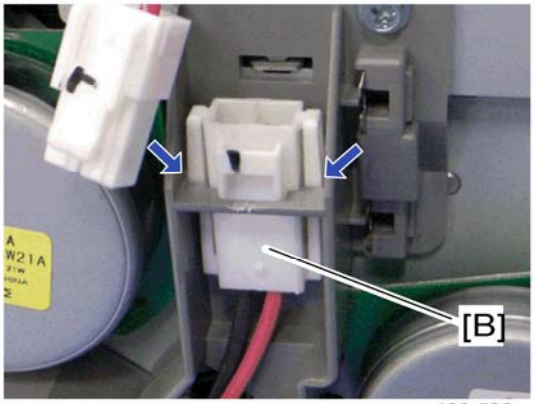
2. AIO cartridge [A]

3.5.2 BLACK AIO MOTOR

1. Left cover (☛ Left Cover)

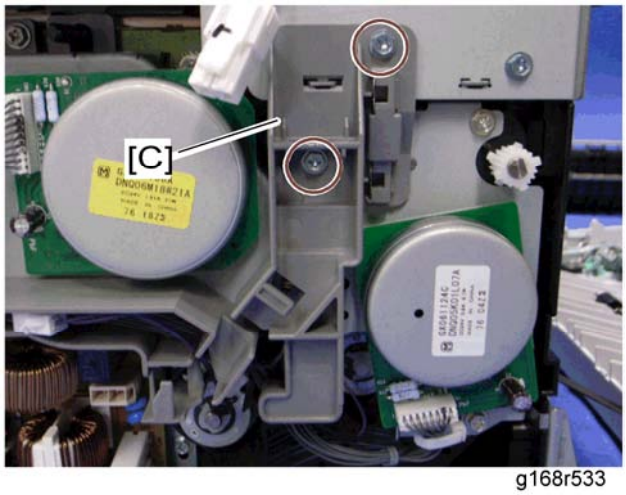


g168r531



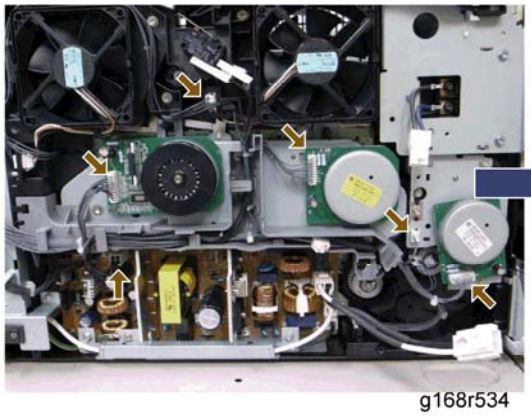
g168r532

2. Disconnect the fusing connector [A] and remove the fusing relay harness [B] (hooks).

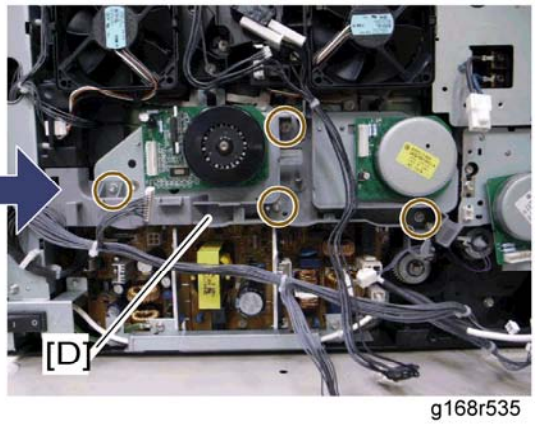


g168r533

3. Fusing harness guide [C] (🔩 x 2)



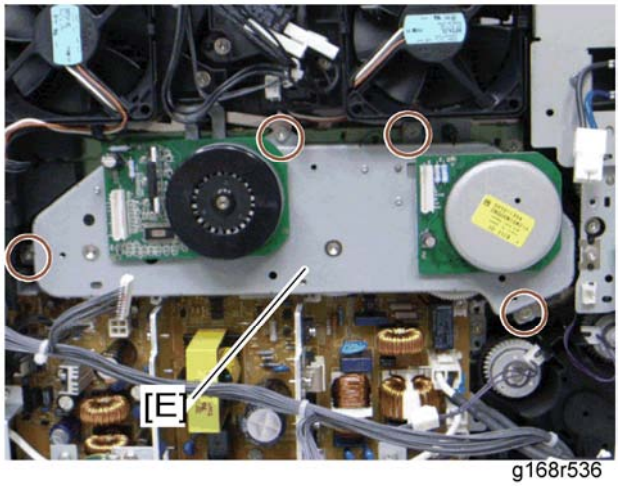
g168r534



g168r535

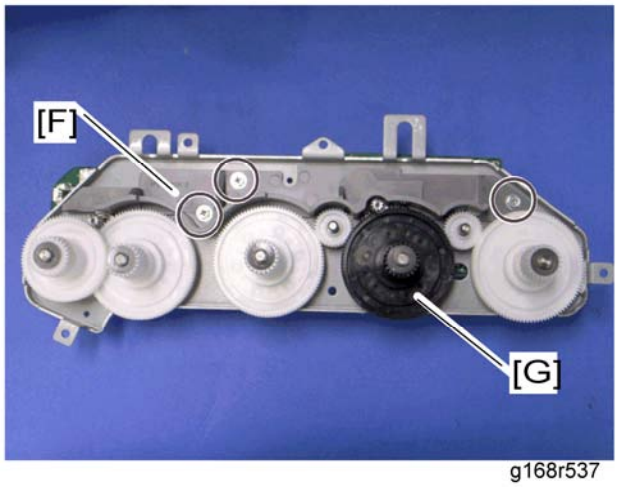
4. Disconnect the connectors shown by arrows in the above picture and release all harnesses on the harness guide [D].
5. Harness guide [D] (🔩 x 4)

AIO Cartridge



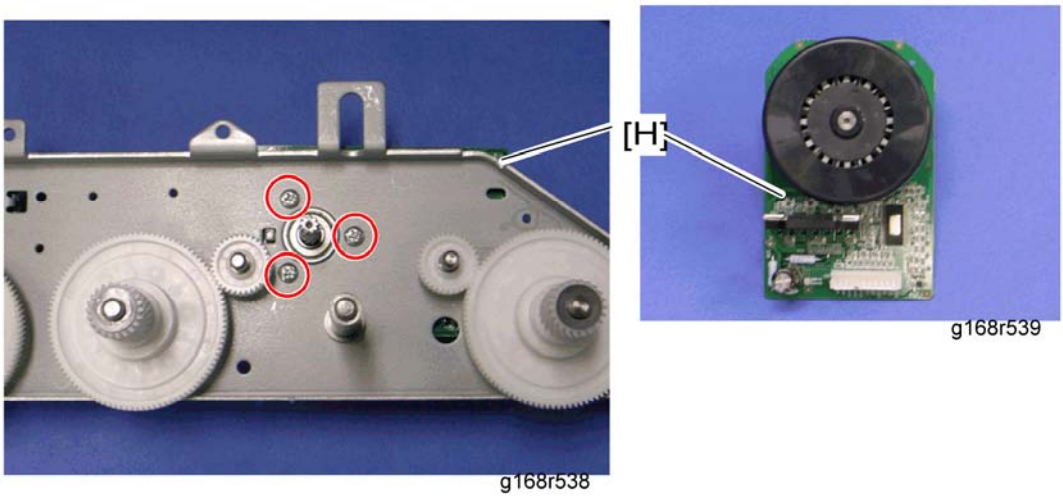
g168r536

6. Drive unit [E] (🔩 x 4)



g168r537

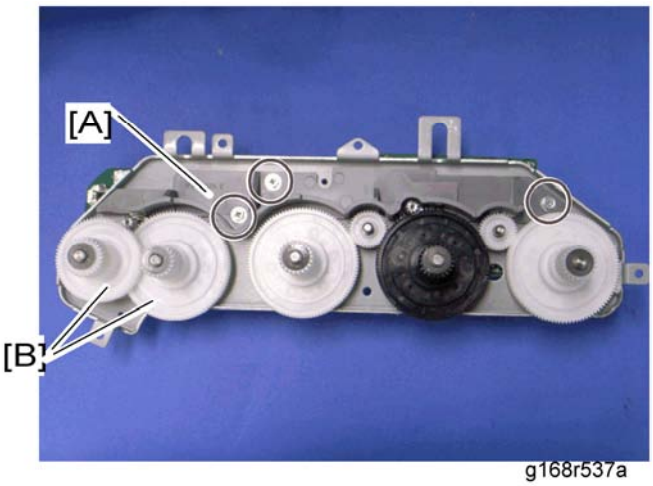
7. Drive unit guide [F] (🔩 x 3)
8. Black AIO gear [G] (snap ring x 1)



9. Black AIO motor [H] (🔩 x 3)

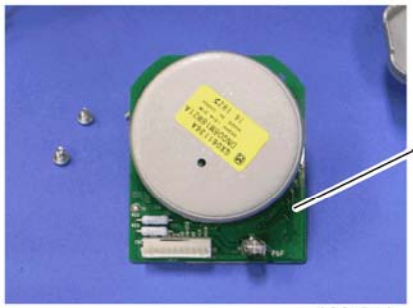
3.5.3 COLOR AIO MOTOR

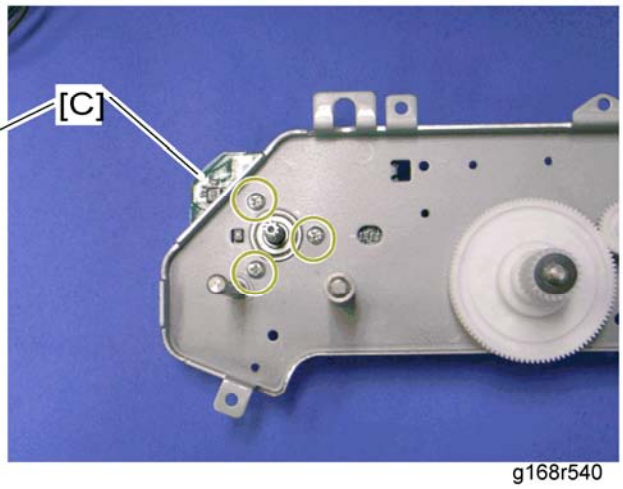
1. Drive unit (☛ Black AIO Motor)



g168r537a

2. Drive unit guide [A] (☞ x 3)
3. Color AIO gears [B] (ring stopper x 1 each)


g168r541



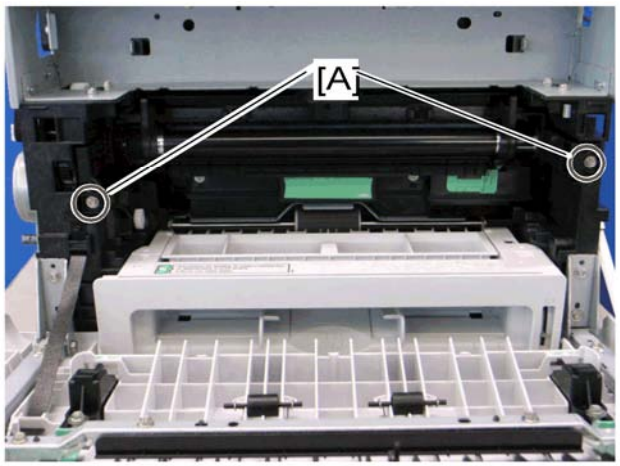
g168r540

4. Color AIO motor [C] (☞ x 3)

3.6 IMAGE TRANSFER

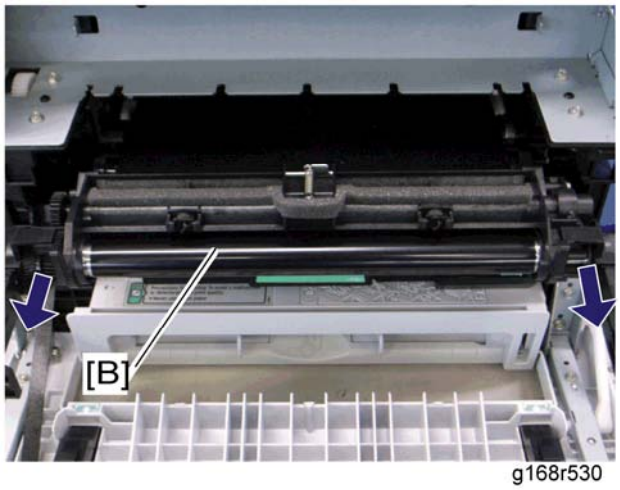
3.6.1 IMAGE TRANSFER BELT UNIT

1. Remove all the AIO cartridges (☛ AIO Cartridge).
2. Fusing unit (☛ Fusing Unit)
3. Transfer unit (☛ Transfer Unit)
4. Remove the waste toner bottle.



g168r529

5. Remove the two screws [A].



g168r530

6. Pull out the image transfer belt unit [B].

After replacing the image transfer belt unit

Important

- Do the following step 2 with the front cover of the machine open.

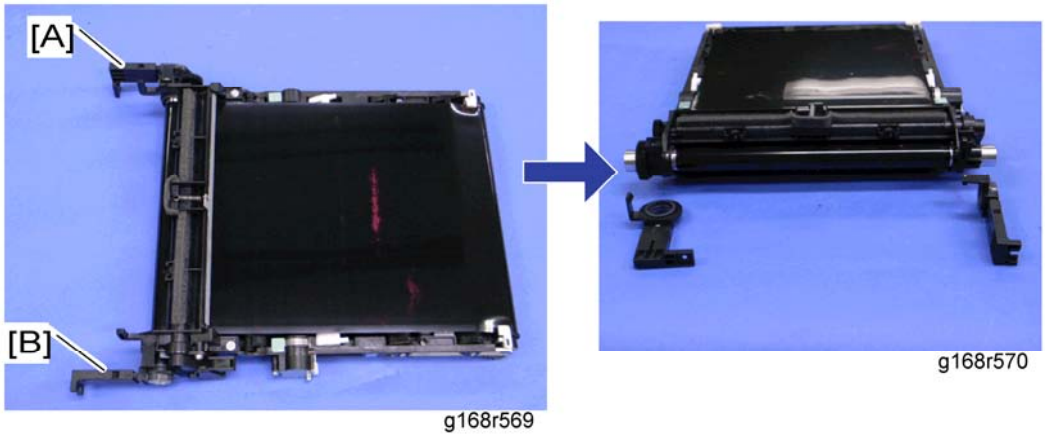
1. Open the front cover and turn on the machine.
2. Execute "Reset Transfer Unit Life Counter" with the "SP Mode 2" tab (printer model) or the "Engine Maintenance" menu (MF model).
3. Close the front cover.
4. Execute "Trans. Belt Adjust" with the "SP Mode 2" tab (printer model) or the "Engine Maintenance" menu (MF model).
5. Adjust the registration settings for each tray and for the front and rear sides of the paper with the "SP Mode 2" tab (printer model) or the "Engine Maintenance" menu (MF model) if necessary.

3.6.2 ITB (IMAGE TRANSFER BELT) CLEANING UNIT

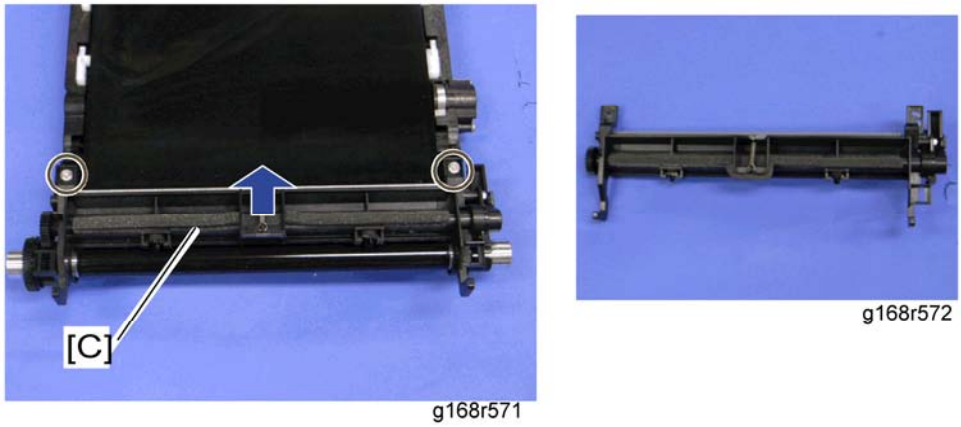
Note

- The ITB cleaning unit contains waste toner. When removing the ITB cleaning unit, put it on a sheet of paper.

1. Image transfer belt unit (☛ Image Transfer Belt Unit)



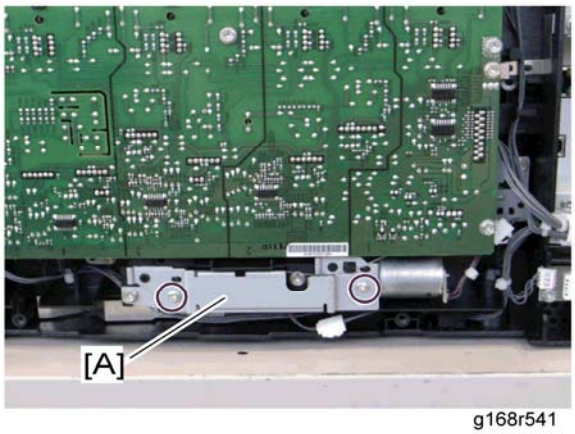
2. Left handle [A] (hook, bushing x 1)
3. Right handle [B] (hook, bushing x 1)



4. ITB cleaning unit [C] (🖉 x 2)

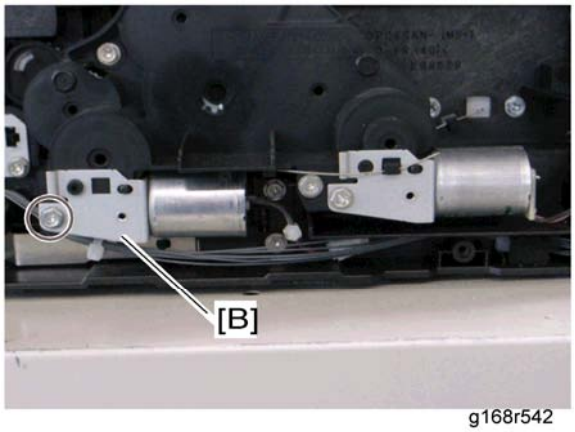
3.6.3 AGITATOR MOTOR

1. Right cover (☛ Right Cover)



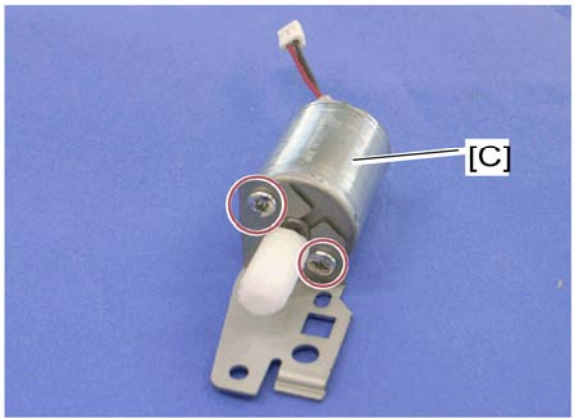
g168r541

2. Motor bracket [A] (🔩 x 2)



g168r542

3. Agitator motor assembly [B] (🔩 x 1, ✋ x 1)

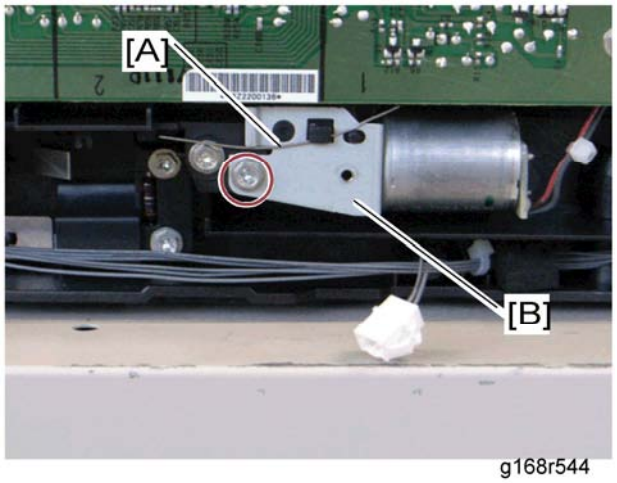


g168r543

4. Agitator motor [C] (🔩 x 2)

3.6.4 ITB (IMAGE TRANSFER BELT) CONTACT MOTOR

1. Agitator motor (☛Agitator Motor)



g168r544

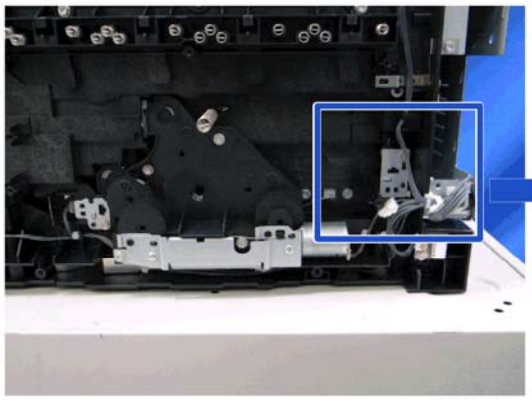
2. Release the wire [A].
3. ITB contact motor assembly [B] (🔩 x 1, 🖐 x 1)

g168r545

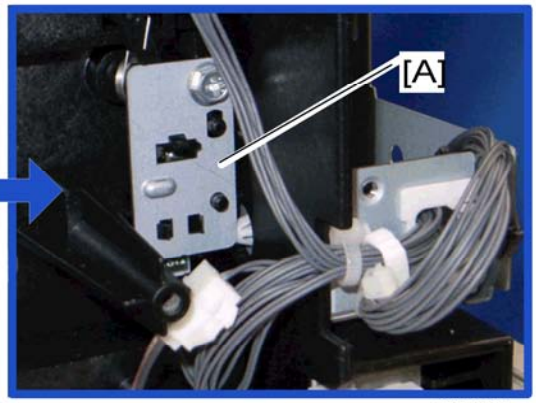
4. ITB contact motor [C] (🔩 x 2)

3.6.5 ITB (IMAGE TRANSFER BELT) CONTACT SENSOR

1. Right cover (☛ Right Cover)
2. High voltage power supply board (☛ High Voltage Power Supply Board)

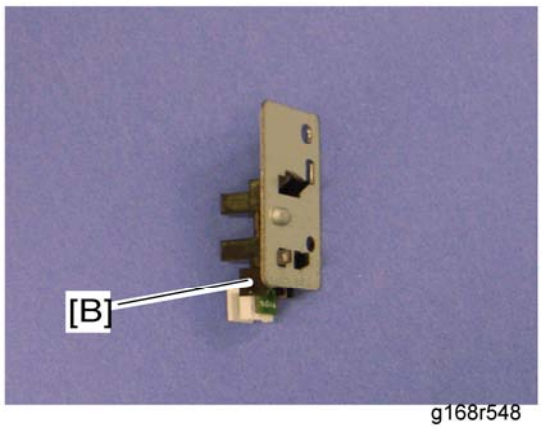


g168r546



g168r547

3. ITB contact sensor assembly [A] (x 1, x 1)



g168r548

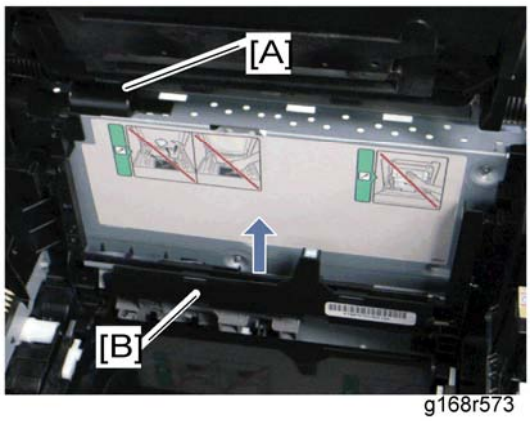
4. ITB contact sensor [B] (hooks)

3.6.6 TM (TONER MARK) SENSOR BASE

1. Open the top cover.
2. Remove all AIO cartridges (☛ AIO Cartridge).
3. Slide the ITB unit to the front side or remove it.
4. Rear cover (☛ Right Cover)
5. Controller box cover (☛ Controller Board)
6. MF models only: Controller bracket (☛ EGB)

g165r689

7. Disconnect CN306 on the EGB (🖘 x 1).

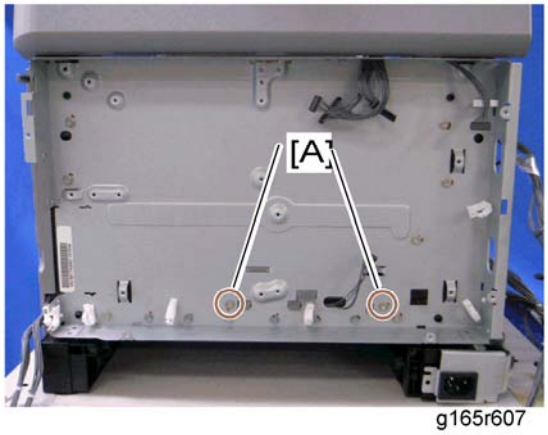


g168r573

8. Harness cover [A] (hook)
9. TM sensor base [B]

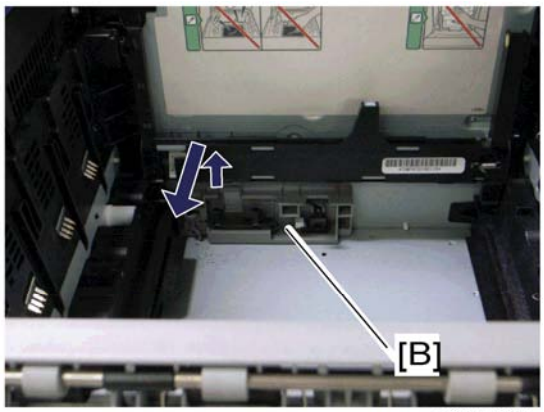
3.6.7 WASTE TONER BOTTLE SET SENSOR

1. Remove all AIO cartridges. (☛ AIO Cartridge)
2. Image transfer belt unit (☛Image Transfer Belt Unit)
3. EGB (☛ EGB)



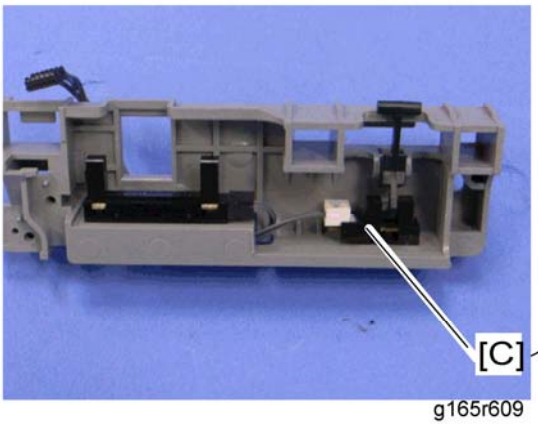
g165r607

4. Remove two screws [A] for the waste toner sensor base.

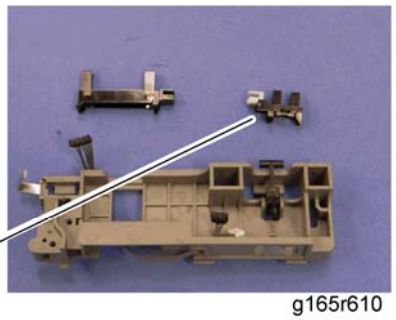


g165r608

5. Waste toner sensor base [B]



g165r609


g165r610

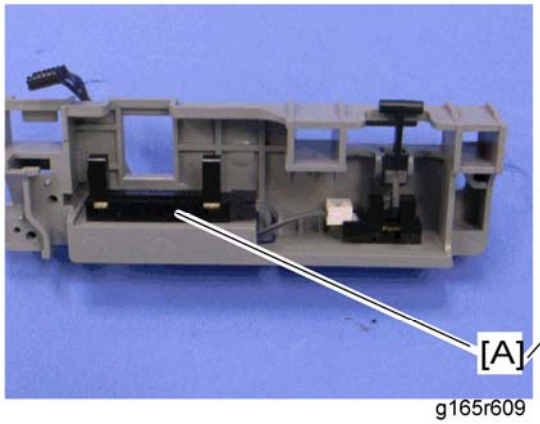
6. Waste toner bottle set sensor [C] (hooks, ☞ x 1)

Note

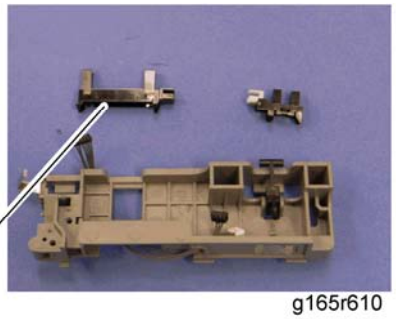
- When reinstalling the waste toner bottle set sensor, connect it to the white connector of the harness.

3.6.8 WASTE TONER OVERFLOW SENSOR

1. Remove all AIOs. (☛ AIO Cartridge)
2. Image transfer belt unit (☛Image Transfer Belt Unit)
3. EGB (☛ EGB)
4. Waste toner sensor base (☛ Waste Toner Bottle Set Sensor)



g165r609


g165r610

5. Waste toner overflow sensor [A] (hooks, ☜ x 1)

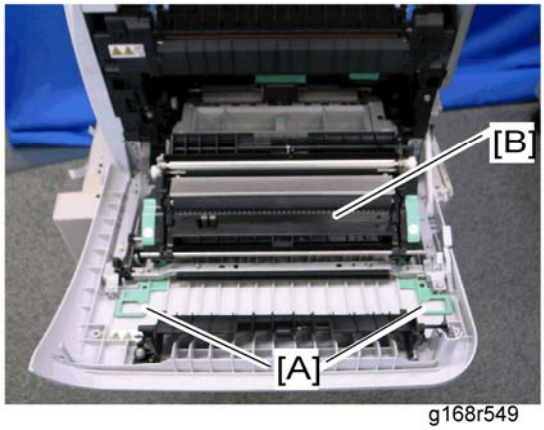
Note

- When reinstalling the waste toner overflow sensor, connect it to the black connector of the harness.

3.7 PAPER TRANSFER

3.7.1 TRANSFER UNIT

1. Open the front cover.

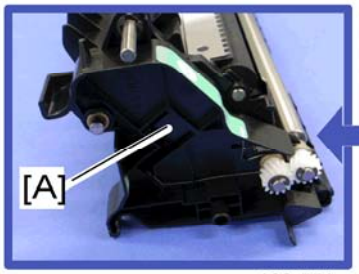


g168r549

2. Release the locks [A].
3. Transfer unit [B]

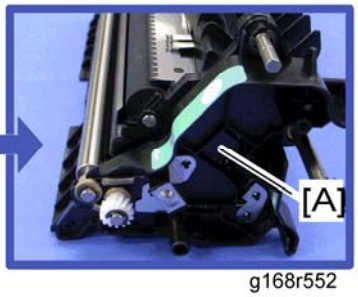
3.7.2 TRANSFER ROLLER

1. Transfer Unit (☛ Transfer Unit)



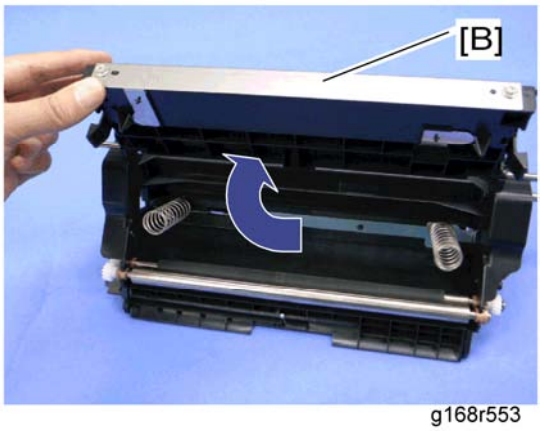
g168r551

g168r550



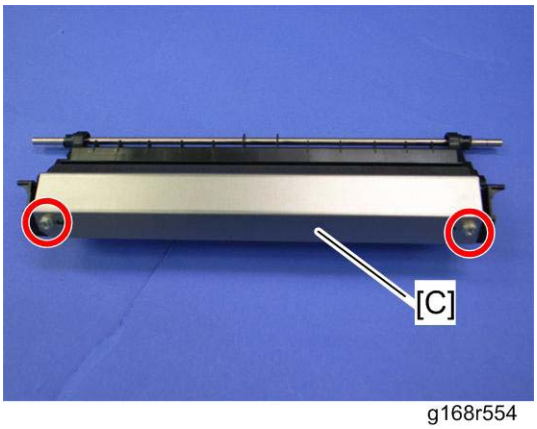
g168r552

2. Release the two hooks [A] at both sides of the transfer unit.



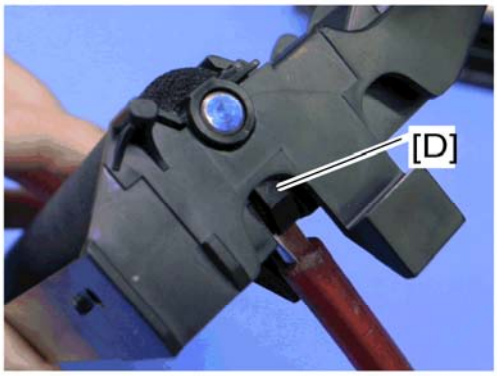
g168r553

3. Open the transfer roller unit [B] and remove it.

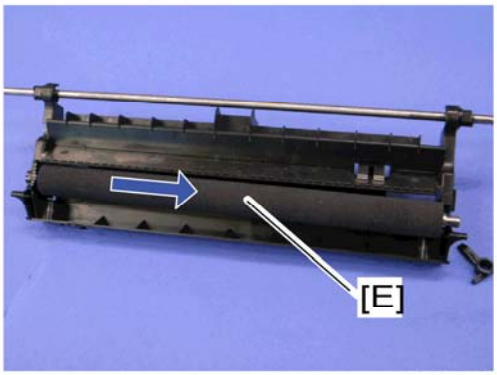


g168r554

4. Transfer roller assembly [C] (🔩 x 2)



g168r555

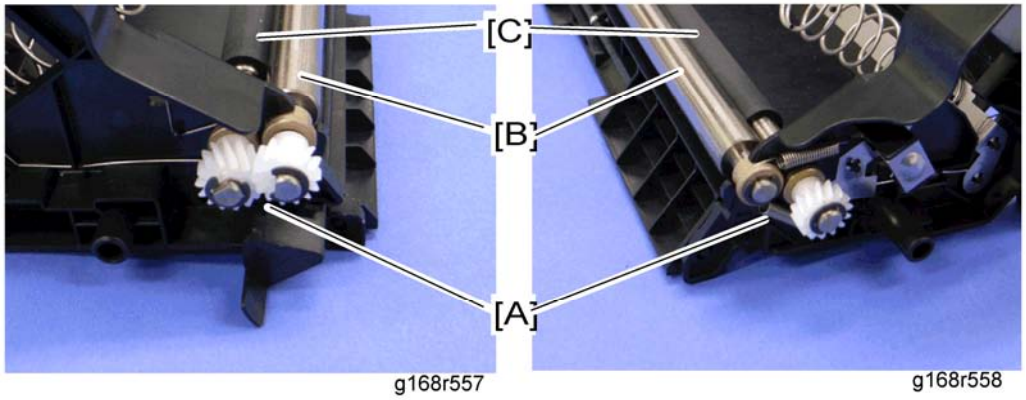


g168r556

5. Release the holder [D] at the left side of the transfer roller unit (hook).
6. Transfer roller [E]

3.7.3 REGISTRATION ROLLER

1. Transfer unit (☛ Transfer Unit)
2. Transfer roller unit (☛ Transfer Roller)



g168r557 g168r558

3. Tension springs [A] (both sides)
4. Registration idle roller [B] (℃ x 2, gear x 1, bushing x 2)
5. Registration roller [C] (℃ x 2, gear x 2, bushing x 2)

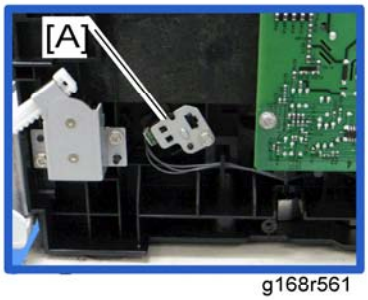
Reassembling the registration roller unit

g168r559

When installing the tension spring, make sure that the tension spring correctly hooks onto the bushing of the registration idle roller as shown above [A].

3.7.4 REGISTRATION SENSOR

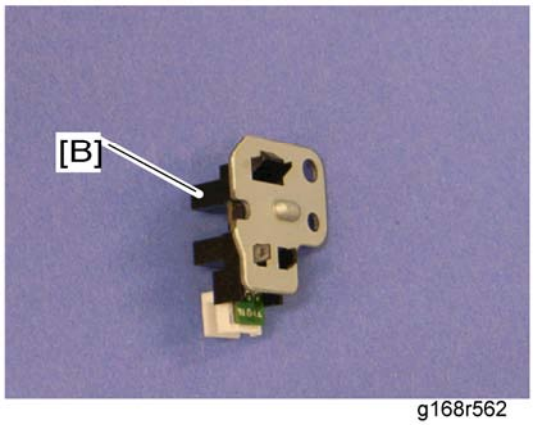
1. Right Cover (☛ Right Cover)



g168r561

g168r560

2. Registration sensor assembly [A] (🔩 x 1, 🖐 x 1)

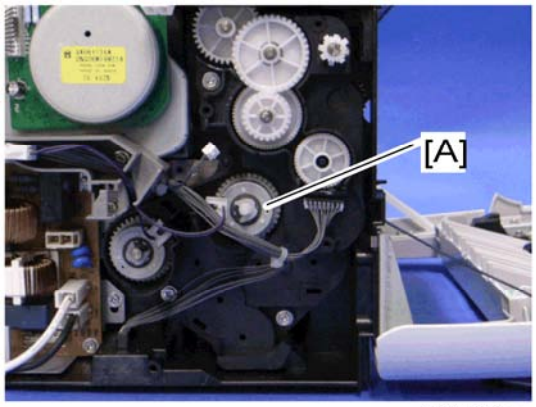


g168r562

3. Registration sensor [B] (hooks)

3.7.5 REGISTRATION CLUTCH

1. Rear cover (☛ Rear Cover)
2. Left cover (☛ Left Cover)
3. Transport/Fusing motor (☛ Transport/Fusing Motor)



g165d592

4. Registration clutch [A] (🔩 x 1)

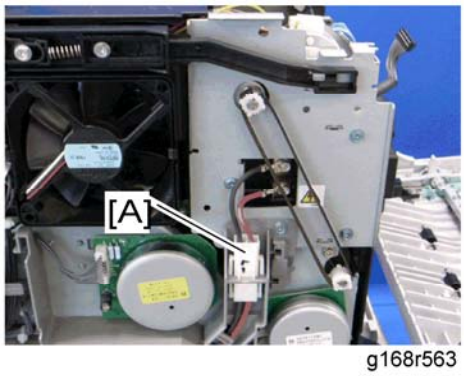
3.8 IMAGE FUSING

⚠CAUTION

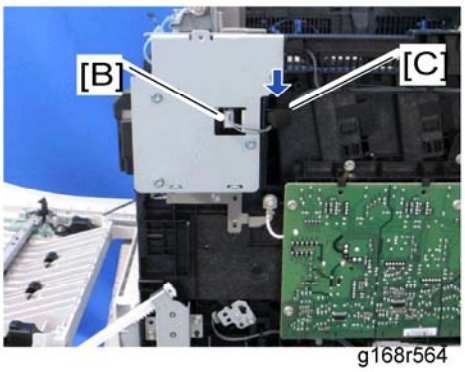
- Make sure that the fusing unit is cool before you touch it. The fusing unit can be very hot.
- Make sure to restore the insulators, shields, etc after you service the fusing unit.

3.8.1 FUSING UNIT

1. Open the front cover.
2. Rear cover (☛ Rear Cover)
3. Right cover (☛ Right Cover)
4. Left cover (☛ Left Cover)



g168r563

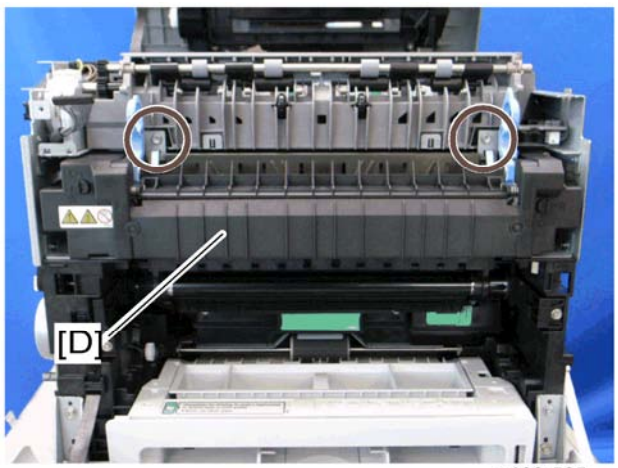


g168r564

5. Disconnect the connectors [A] (hook) [B].

Note

- The sponge [C] clamps the harness. Install this sponge in the same position after reinstalling the fusing unit.



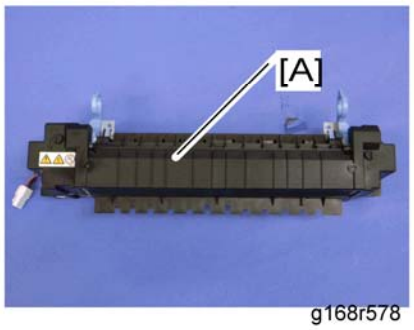
g168r565

6. Fusing unit [D] (🔩 x 2)

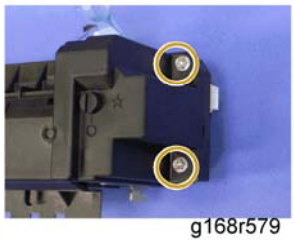
3.8.2 FUSING LAMP

1. Fusing unit (☛ Fusing Unit)

g168r580



g168r578


g168r579

2. Fusing front cover [A] (🔩 x 4)

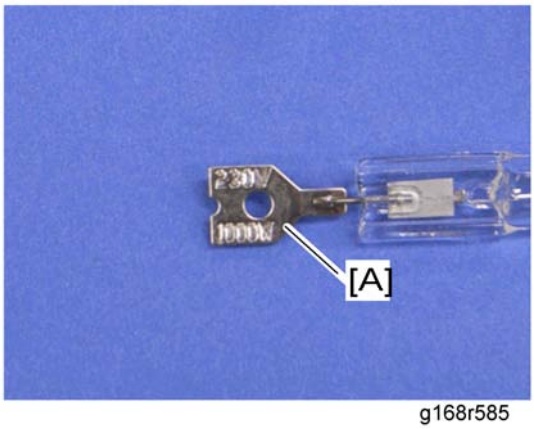
g168r584

g168r581

g168r582

3. Fusing lamp [B] (🔩 x 2, ground cable x 1)

When Reinstalling the Fusing Lamp

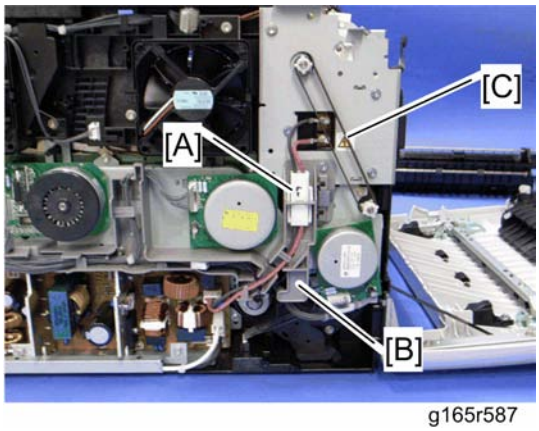


g168r585

The terminal [A], which shows the voltage and power ratings, must be placed at the left side of the fusing unit (fusing cable side).

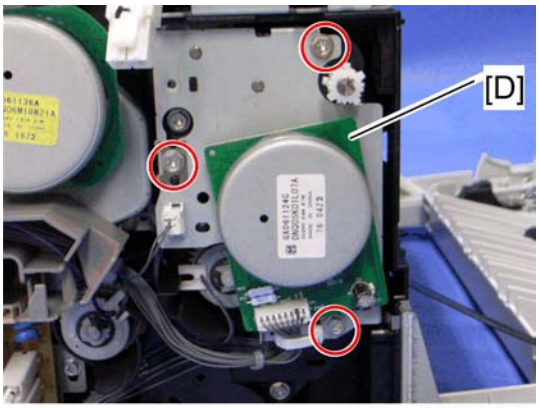
3.8.3 TRANSPORT/FUSING MOTOR

1. Rear cover (☛ Rear Cover)
2. Left cover (☛ Left Cover)



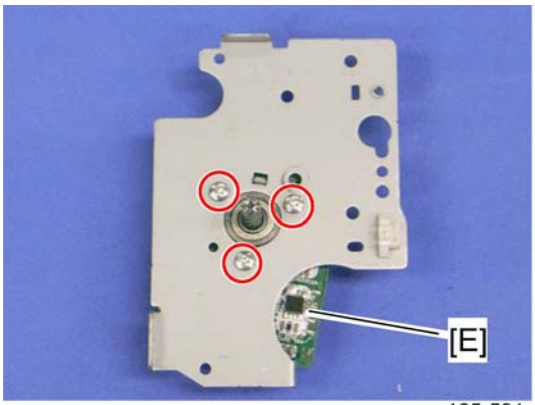
g165r587

3. Disconnect the fusing connector [A] (hook).
4. Fusing harness guide [B] (🔩 x 2)
5. **For only the duplex model:** Duplex timing belt [C]

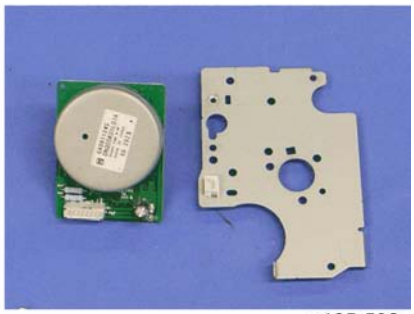


g165r590

6. Transport/Fusing motor assembly [D] (🔩 x 3, 🖐 x 3, ground plate x 1)



g165r591

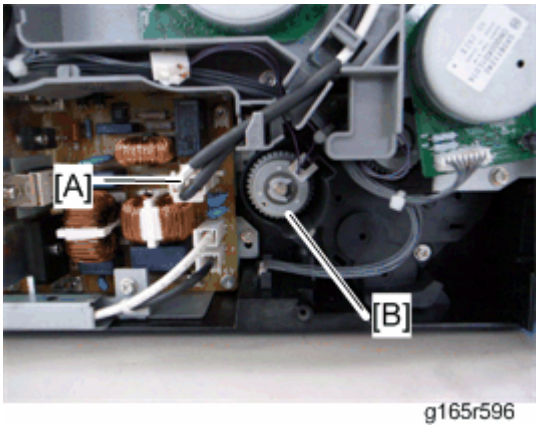

g165r592

7. Transport/Fusing motor [E] (🔩 x 3)

3.9 PAPER FEED

3.9.1 PAPER FEED CLUTCH

1. Rear cover (☛ Rear Cover)
2. Left cover (☛ Left Cover)



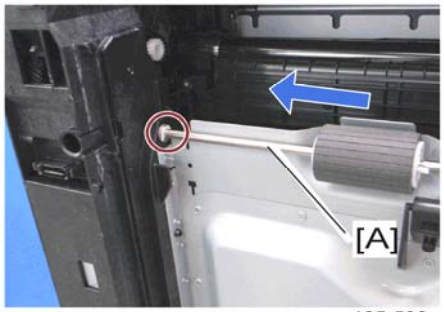
g165r596

3. Disconnect the fusing relay harness [A] (hook).
4. Paper feed clutch [B] (⚙ x 1, ✋ x 1)

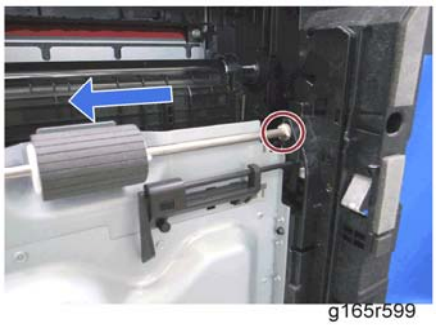
3.9.2 PAPER FEED ROLLER

1. Remove all the AIO cartridges.
2. Remove the waste toner bottle.
3. Rear cover (☛ Rear Cover)
4. Left cover (☛ Left Cover)
5. Paper feed clutch (☛ Paper Feed Clutch)
6. Close the top cover and front cover.
7. Pull out the tray.
8. Stand the machine with the rear side facing the table.

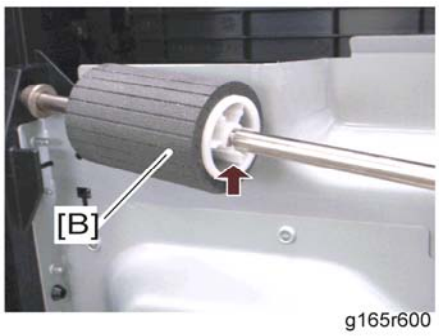
g165r597



g165r598


g165r599

9. Slide the paper feed shaft [A] to the left side (x 2).



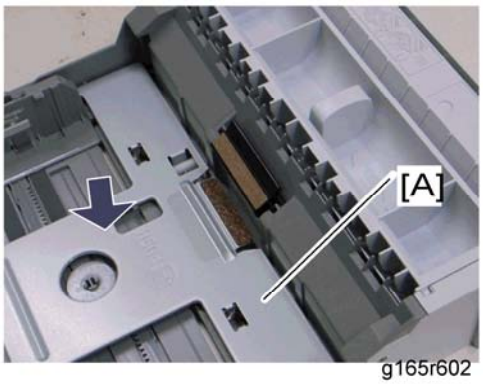
g165r600

g165r601

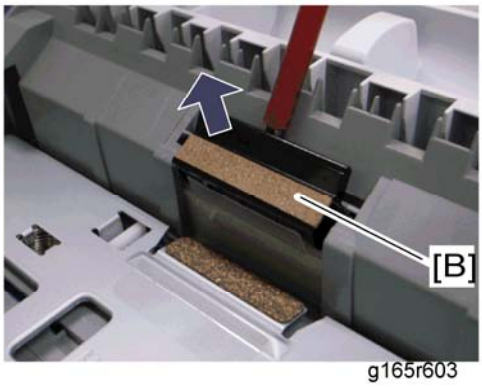
10. Paper feed roller [B] (hook)

3.9.3 SEPARATION PAD

1. Pull out the tray.



g165r602



g165r603

2. Push down the bottom plate [A].
3. Separation pad [B] (hooks, spring x 1)

g165r603

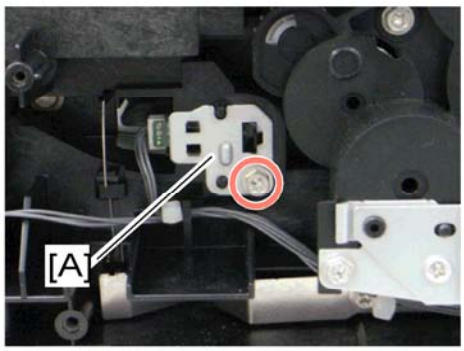
g165r604

Note

- When reinstalling the separation pad, make sure that the mylar [C] is not placed under the separation pad. The right side image above shows incorrect installation.

3.9.4 PAPER END SENSOR

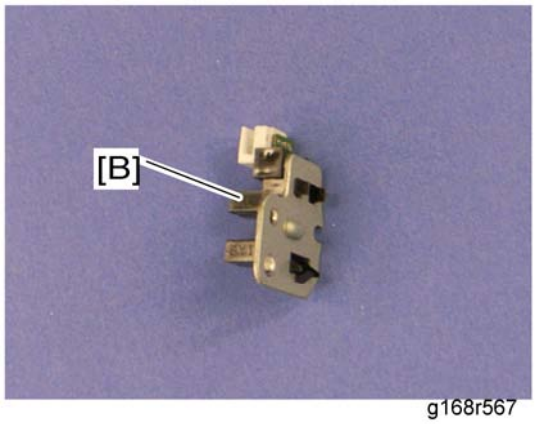
1. Rear cover (☛ Rear Cover)
2. Right cover (☛ Right Cover)
3. High voltage power supply board (☛ High Voltage Power Supply Board)



g168r566

g168r546

4. Paper end sensor assembly [A] (☞ x 1)



g168r567

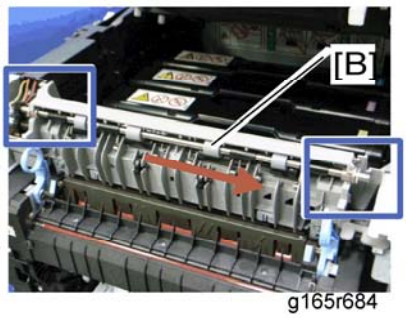
5. Paper end sensor [B] (hooks)

3.10 PAPER EXIT

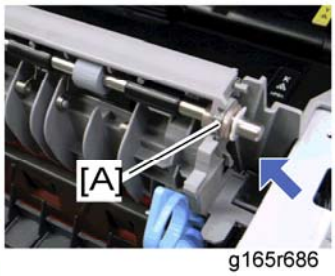
3.10.1 PAPER EXIT ROLLER

1. Operation panel (☛ Operation Panel)

g165r685

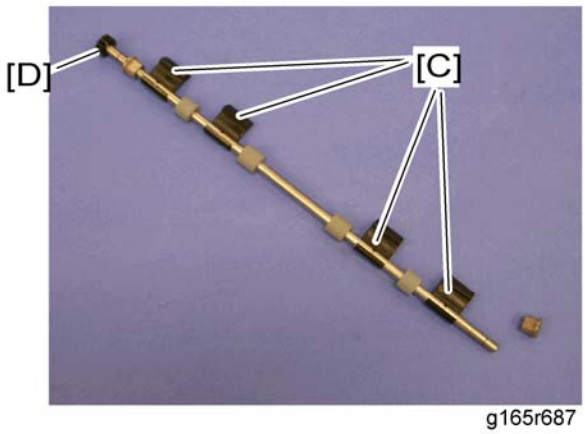


g165r684



g165r686

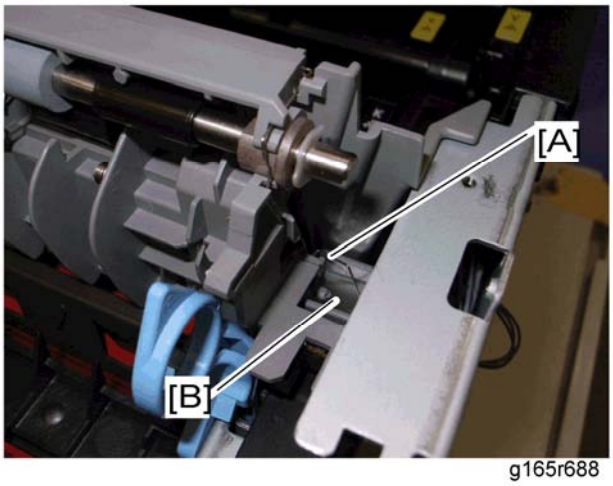
2. Remove the bushing [A] (⟲ x 1)
3. Paper exit roller [B] (⟲ x 1)



g165r687

4. Remove the four exit guides [C] and gear [D] (bushing x 1).

When reinstalling the paper exit roller

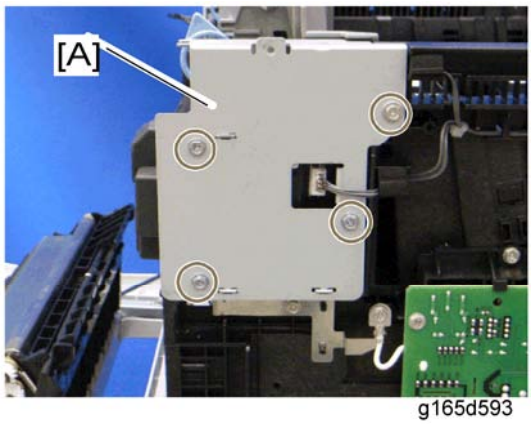


g165r688

Make sure that the ground wire [A] from the discharge sheet touches the ground plate [B] on the machine after reinstalling the paper exit roller.

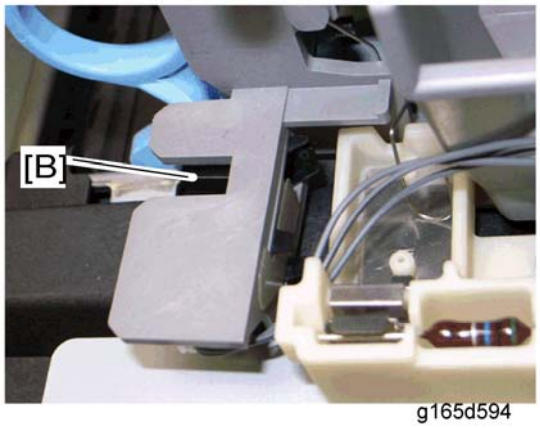
3.10.2 PAPER EXIT SENSOR

1. Rear cover (☛ Rear Cover)
2. Right cover (☛ Right Cover)



g165d593

3. Right bracket [A] (🔩 x 4)



g165d594

g165d595

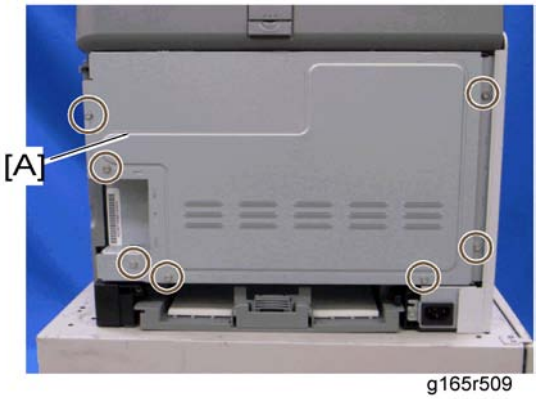
4. Paper exit sensor [B] (hooks, 🖐 x 1)

3.11 ELECTRICAL COMPONENTS

3.11.1 CONTROLLER BOARD

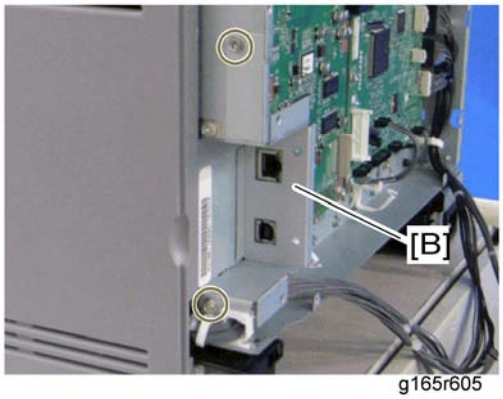
GDI/ PCL Controller Board (Printer Model)

1. Rear cover (☛ Rear Cover)



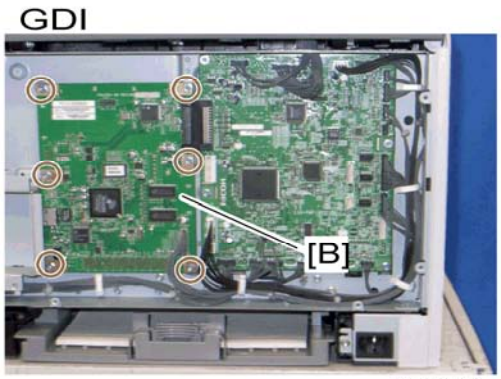
g165r509

2. Controller box cover [A] (🖉 x 7)

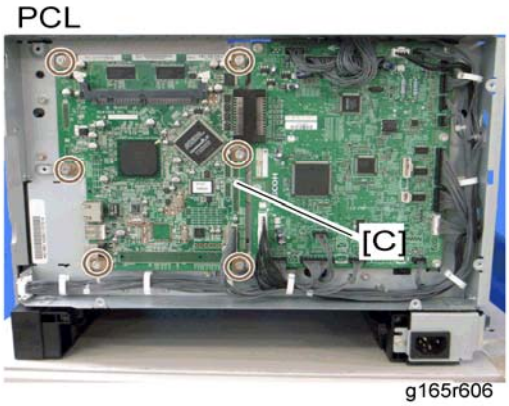


g165r605

3. Interface bracket [B] (🖉 x 2)



g165r511

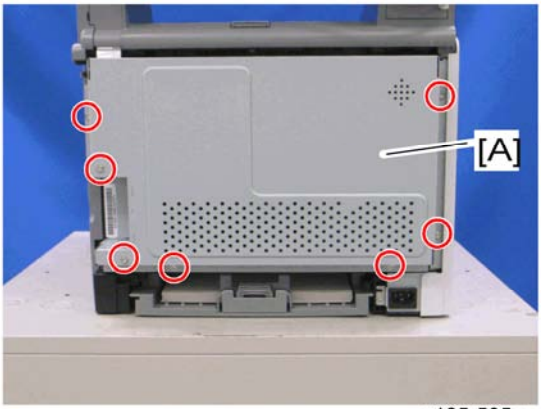


g165r606

4. GDI controller board [B] or PCL controller board [C] (🖉 x 6)

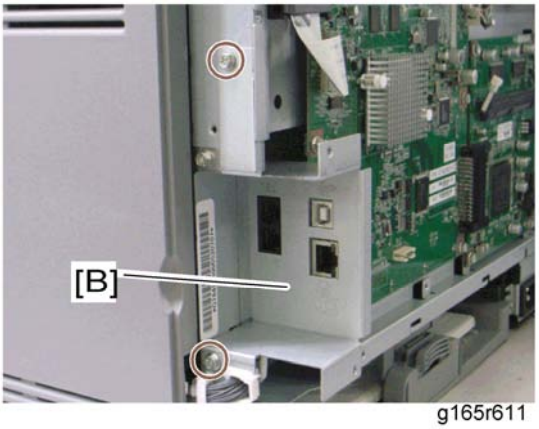
Main Controller Board (MF Model)

1. Rear cover (☛ Rear Cover)



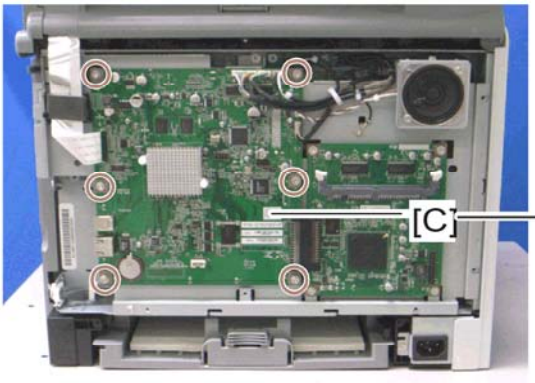
g165r505a

2. Controller box cover [A] (🖉 x 7)

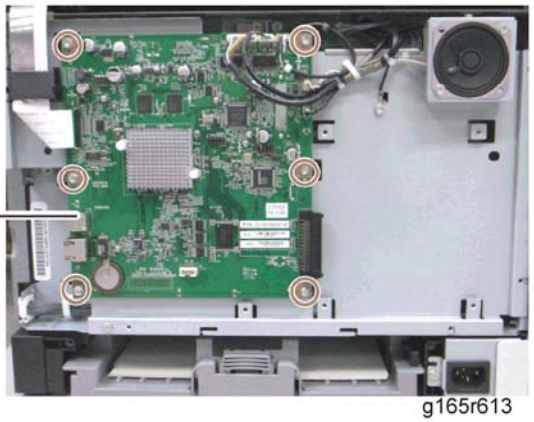


g165r611

3. Interface bracket [B] (🖉 x 2)



g165r612


g165r613

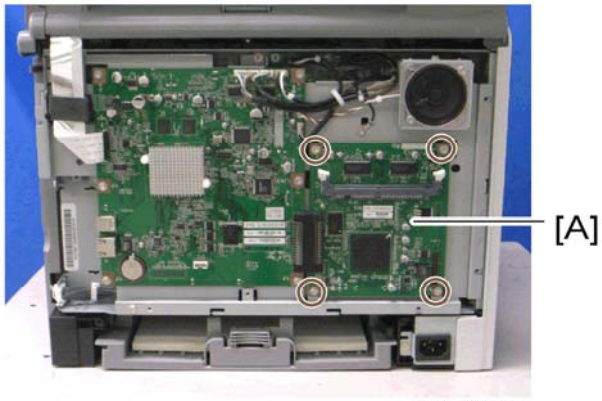
4. Main controller board [C] (flat cable x 1, all 🖑s, 🖉 x 6)

Note

- The photo above left shows the G184, and the photo above right shows the G181 and G183.

PDL Board (G184 only)

1. Rear cover (☛ Rear Cover)
2. Controller box cover (see "Main Controller Board" above)
3. Interface bracket (see "Main Controller Board" above)



g165r612a

4. PDL board [A] (🖉 x 4)

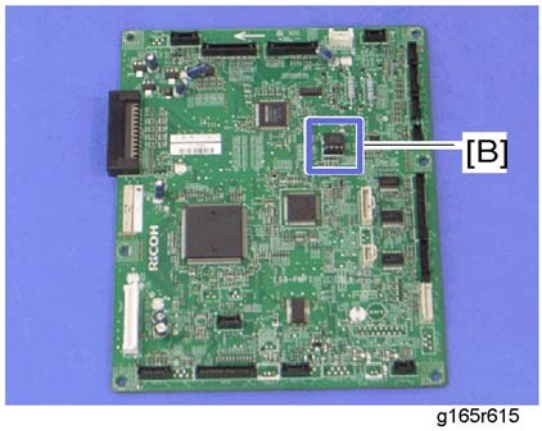
3.11.2 EGB (ENGINE BOARD)

Printer Model

1. Rear cover (☛ Rear Cover)
2. GDI controller or PCL controller board (☛ Controller Board)

g165r614

3. EGB [A] (🔩 x 6, all 🖐s)



g165r615

4. EEPROM [B]

When installing the new EGB

1. Remove the EEPROM from the old EGB.

g165r615

g165r616

2. Install it on the new EGB with the mark [A] pointing to the left side of the board after you replace the EGB.
3. Replace the EEPROM if the EEPROM on the old EGB is defective.

⚠CAUTION

- Keep the EEPROM away from objects that can cause static electricity. Static electricity can damage EEPROM data.
- Make sure that the EEPROM is correctly installed on the EGB.

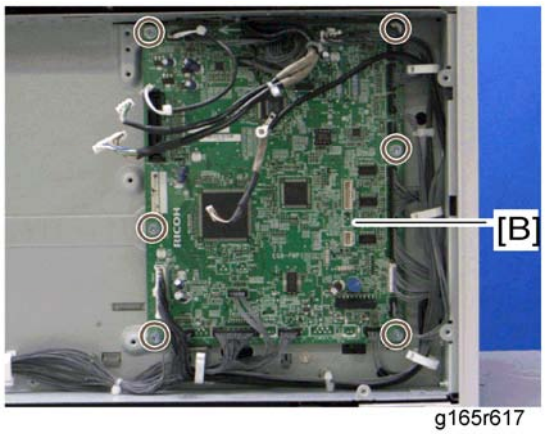
MF Model

1. Rear cover (☛ Rear Cover)
2. Controller box cover (☛ Controller Board)

g165r612

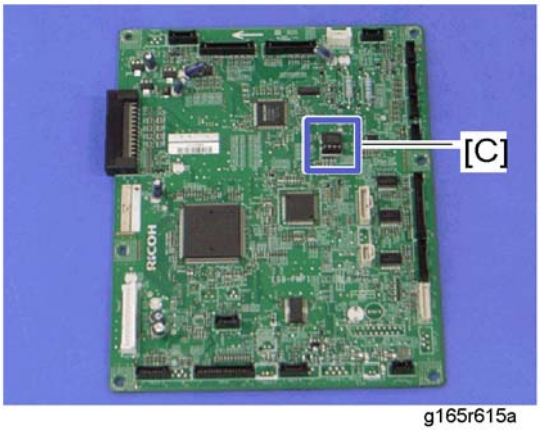
g165r613

3. Controller bracket [A] (🔩 x 3, ground cable x 1, all 🖑s, flat cable x 1)



g165r617

4. EGB [B] (🔩 x 6, all ✋s)



g165r615a

5. EEPROM [C]

When installing the new EGB

1. Remove the EEPROM from the old EGB.

g165r615

g165r616

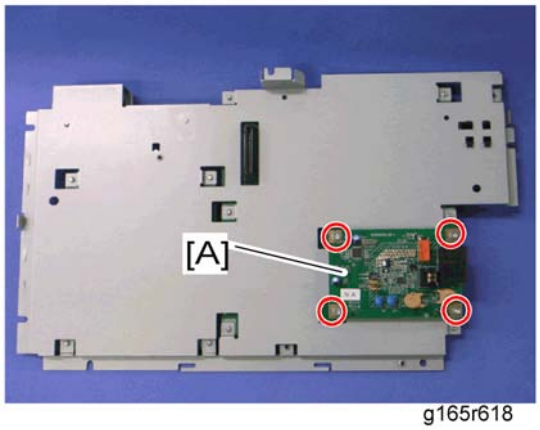
2. Install it on the new EGB with the mark [A] pointing to the left side of the board after you replace the EGB.
3. Replace the EEPROM if the EEPROM on the old EGB is defective.

⚠CAUTION

- Keep the EEPROM away from any objects that can cause static electricity. Static electricity can damage EEPROM data.
- Make sure that the EEPROM is correctly installed on the EGB.

3.11.3 FCU (G183/G184 ONLY)

1. Rear cover (☛ Rear Cover)
2. Controller box cover (☛ Controller Board)
3. Controller bracket (☛ EGB)

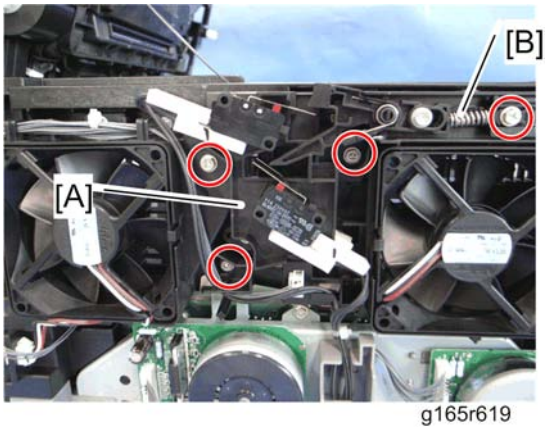


g165r618

4. FCU [A] (🔩 x 4)

3.11.4 INTERLOCK SWITCHES

1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Left cover (☛ Left Cover)

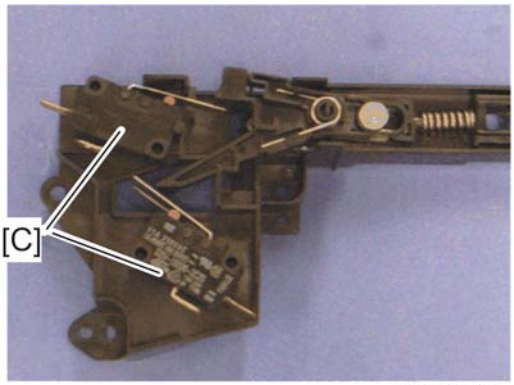


g165r619

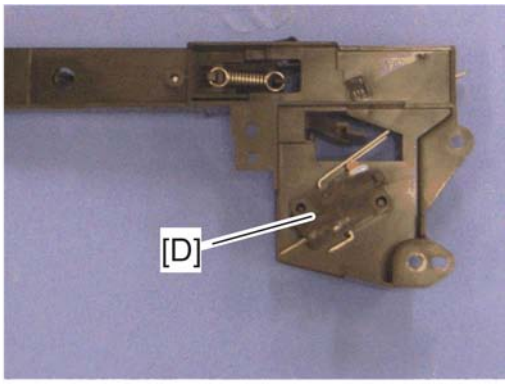
4. Interlock switch base [A] (🔩 x 4, all 🖐s)

Note

- Removing the spring [B] first makes this procedure easier.
- Remove all the connectors after the interlock switch base has been removed.



g165r620

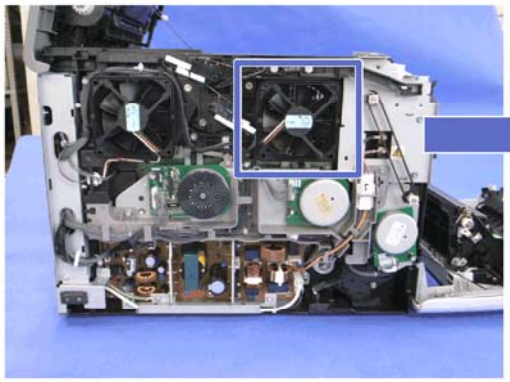


g165r621

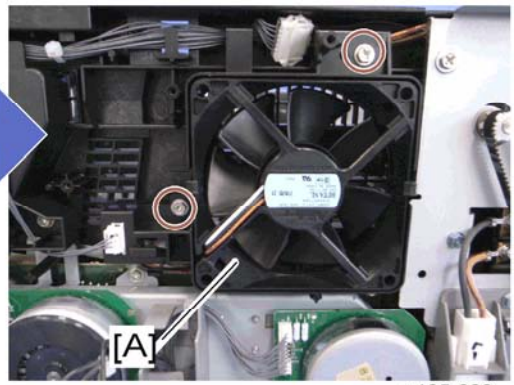
5. Two interlock switches [C] at the outside of the base and one interlock switch [D] at the inside of the base (hooks)

3.11.5 FUSING FAN MOTOR

1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Left cover (☛ Left Cover)
4. Interlock switch base (☛ Interlock Switches)

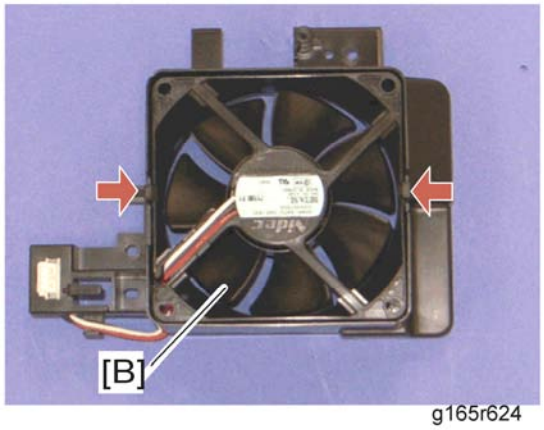


g165r622



g165r623

5. Fusing fan base [A] (🔩 x 2, ✋ x 1)



g165r624

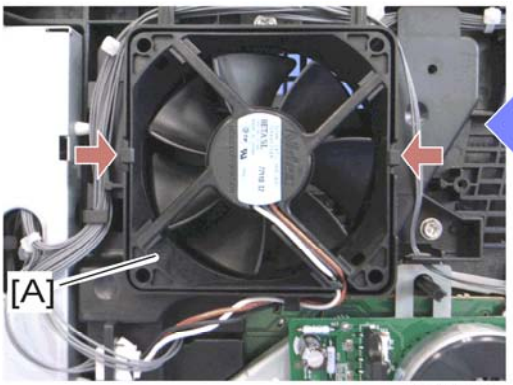
6. Fusing fan motor [B] (hooks, ✋ x 1)

⚠CAUTION

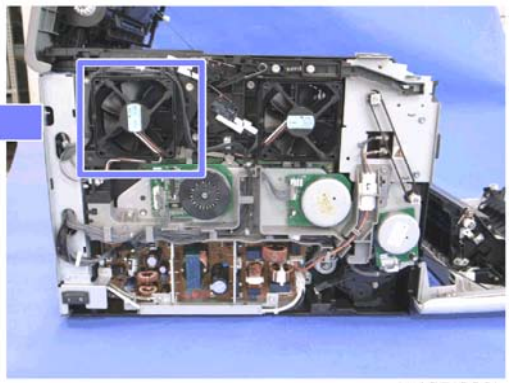
- Install the fusing fan motor with its decal facing the outside of the machine.

3.11.6 LSU FAN MOTOR

1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Left cover (☛ Left Cover)



g165r625


g165r622

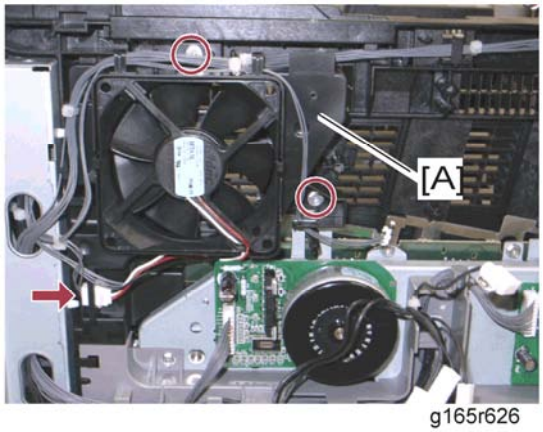
4. LSU fan motor [A] (hooks, ☞ x 1)

⚠CAUTION

- Install the LSU fan motor with its decal facing the outside of the machine.

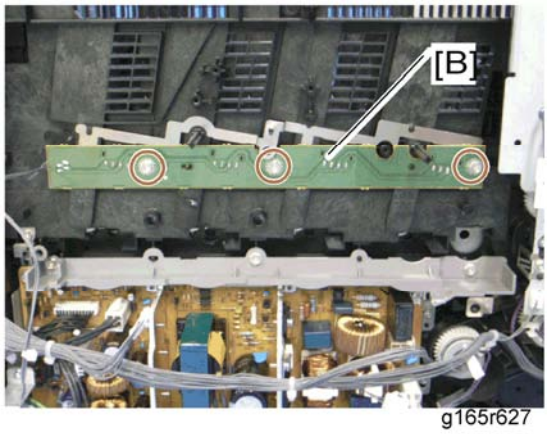
3.11.7 ID CHIP BOARD

1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Left cover (☛ Left Cover)
4. Controller box cover (printer model: ☛ Controller Board) or controller bracket (MF model: ☛ Controller Board)
5. Disconnect the connector (CN305) on the EGB.
6. Interlock switch base (☛ Interlock Switches)
7. Fusing fan base (☛ Fusing Fan Motor)
8. Drive unit (☛ Black AIO Motor)



g165r626

9. Move the harnesses away from the LSU fan base [A].
10. LSU fan base [A] (x 2, x 1)

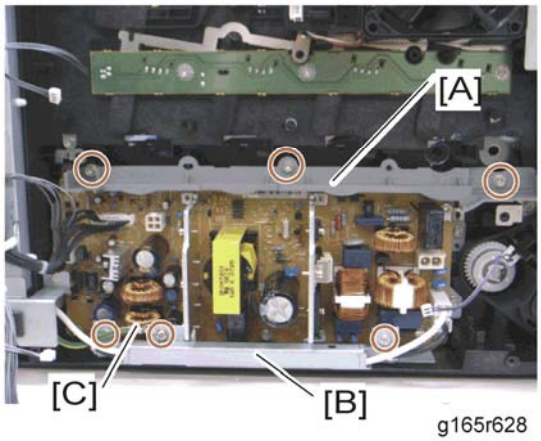


g165r627

11. ID Chip Board [B] (x 3)

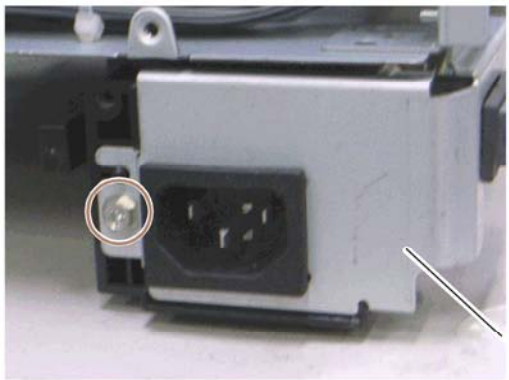
3.11.8 PSU

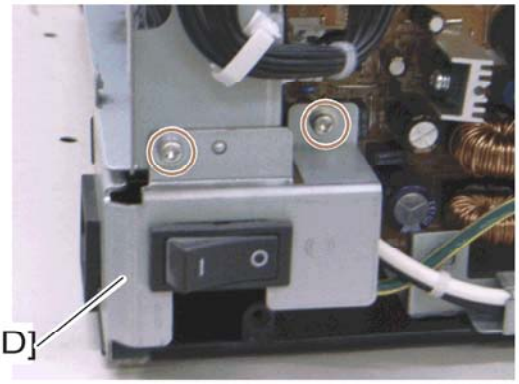
1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Left cover (☛ Left Cover)
4. Drive unit (☛ Black AIO Motor)
5. LSU fan base (☛ LSU Fan Motor)



g165r628

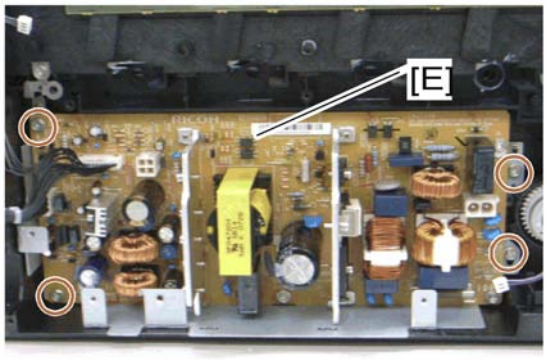
6. PSU guide [A] (🔩 x 3)
7. Power cord bracket [B] (🔩 x 2)
8. Ground cable [C] (🔩 x 1)


g165r629



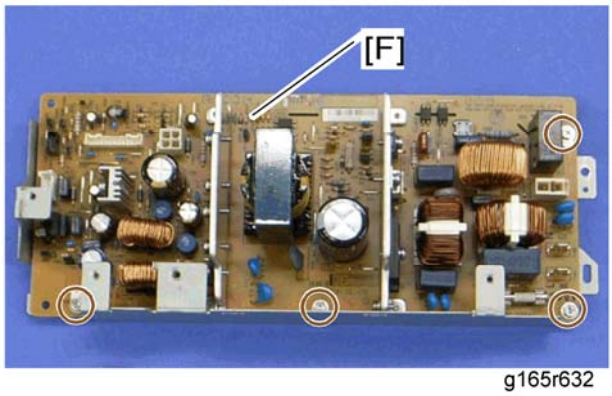
g165r630

9. Power switch assembly [D] (🔩 x 3, ✋ x 2)



g165r631

10. PSU assembly [E] (🔩 x 4, all 🖑s)



g165r632

11. PSU [F] (🔩 x 4)

Fuse

There is a removable fuse on the PSU.

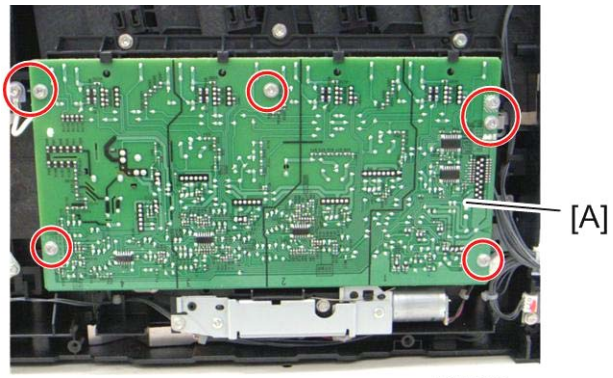
Fuse No.	Rating
FU101: NA	15 A, 125V
FU101: EU, ASIA	6.3A, 250V

⚠CAUTION

- Use a correct rating fuse for the fuse replacement. Never use a wrong rating fuse. If you do, the machine may be damaged.
- Never try direct connection of PSU circuit without a fuse.

3.11.9 HIGH VOLTAGE POWER SUPPLY BOARD

1. Remove all AIO cartridges.
1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Right cover (☛ Right Cover)

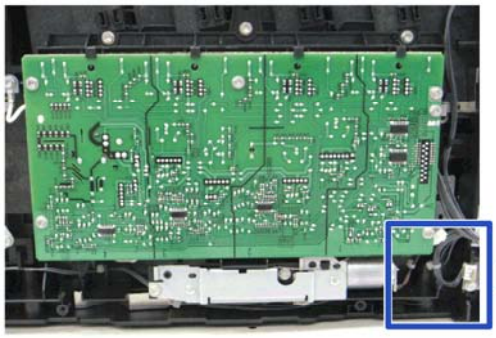


g165r682a

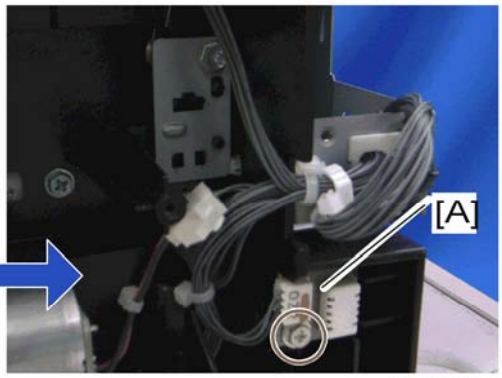
4. High Voltage Power Supply Board [A] (🔩 x 7, ground cable x 1, 🖐 x 1)

3.11.10 TEMPERATURE/HUMIDITY SENSOR

1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Right cover (☛ Right Cover)



g165r682

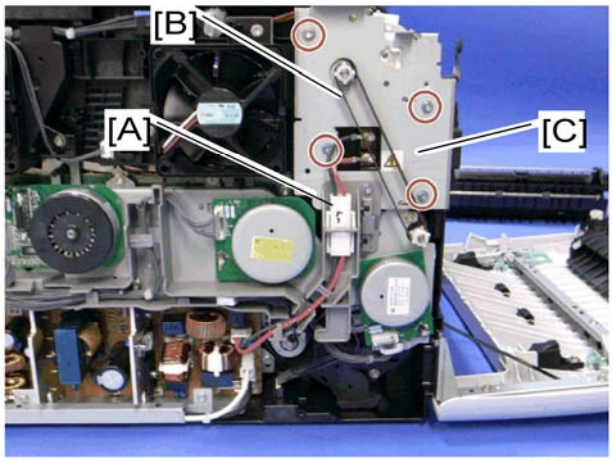


g165r683

4. Temperature/Humidity sensor [A] (🔩 x 1, 🖐 x 1)

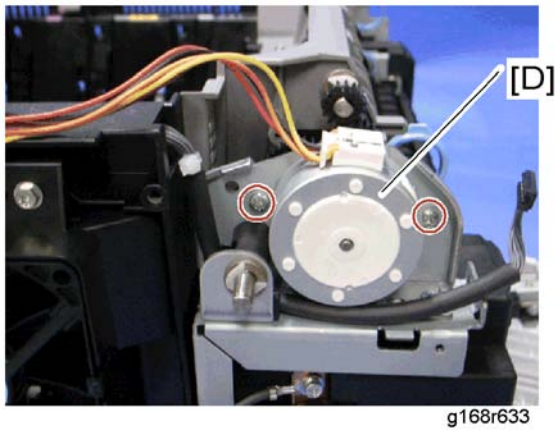
3.11.11 DUPLEX MOTOR (DUPLEX MODEL)

1. Operation panel (☛ Operation Panel)
2. Rear cover (☛ Rear Cover)
3. Left cover (☛ Left Cover)



g168r587a

4. Disconnect the fusing connector [A]
5. Duplex timing belt [B]
6. Left bracket [C] (🔩 x 4)

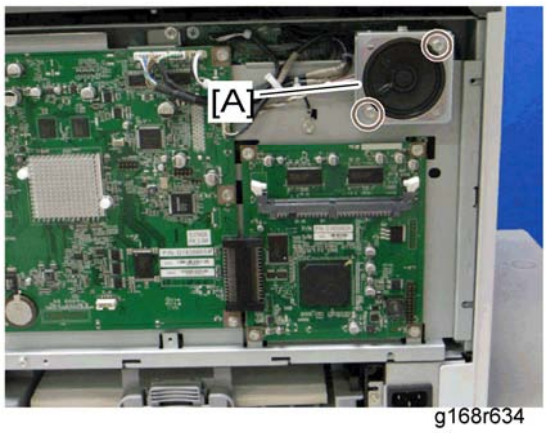


g168r633

7. Duplex motor [D] (🔩 x 2, 🖐 x 1)

3.11.12 SPEAKER (G183/G184 ONLY)

1. Rear cover (☛ Rear Cover)
2. Controller box cover (☛ Controller Board)



3. Speaker [A] (🔩 x 2, 🖐 x 1)

3.11.13 EEPROM

Note

- Replacement and Reinstallation procedures for the EEPROM are included in the "EGB (Engine Board)" replacement procedure. Refer to "EGB (Engine Board)" for details.

When replacing an old EEPROM with a new EEPROM, EEPROM setting is required.

Follow the EEPROM setting procedure described below.

Printer Model

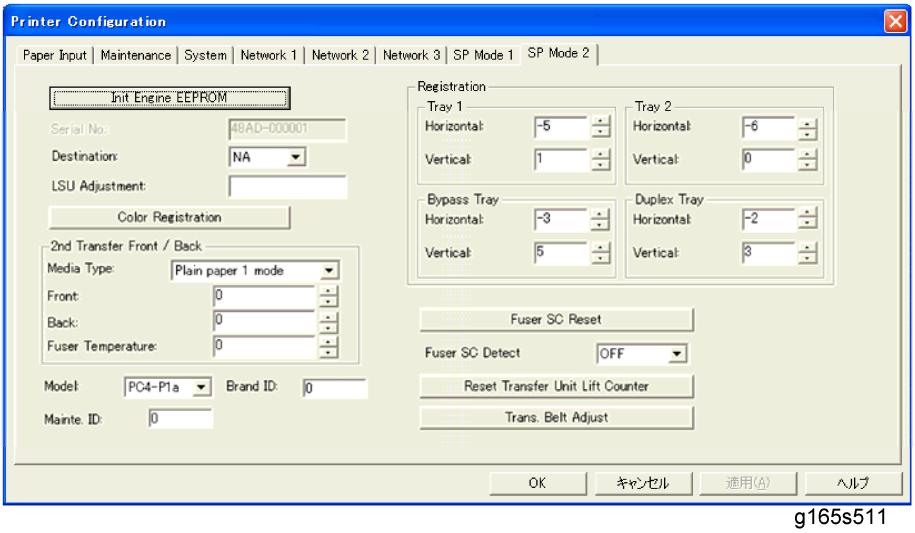
Important

- Do the following steps 1 to 11 with the front cover of the machine open. After completing these steps, turn off the machine.

1. Open the front cover and turn on the machine.

Note

- The machine may issue an error code (because the cover is open), but continue this procedure.



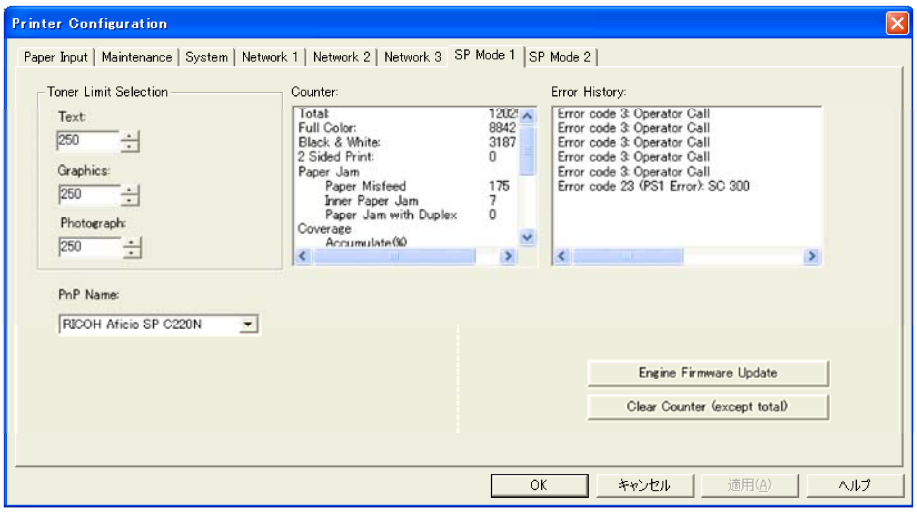
g165s511

2. Access the "SP Mode 2" tab.
3. Click the "Init Engine EEPROM" button to initialize the EEPROM.
4. Input the serial number in the "Serial No." box.

Note

- Ask your supervisor about how to input the serial number in its box.

5. Select a destination from the "Destination" box.
6. Select a model from the "Model" box.
7. Click the "SP Mode 1" tab.



g165s510

8. Select a plug and play name from the "PnP Name" box.
9. Click the "SP Mode 2" tab.
10. Input the LSU (laser optics housing unit) setting values in the "LSU Adjustment" box.
11. Turn off the machine.
12. Turn on the machine with the front cover open.
13. Enter SP Mode 2.
14. Close the front cover.
15. Click "Trans. Belt Adjust" to adjust the ITB (Image Transfer Belt) unit.
16. Select "ON" or "OFF" for the consecutive fusing jam detection with the "Fuser SC Detect" box.

Note

- The default setting is "OFF." Select "ON" only if the customer wants to use this feature.

17. Adjust the registration for each direction (vertical and horizontal) and trays with the "Registration" boxes if necessary.
18. Adjust the transfer roller bias and the temperature reduction of the fusing unit for each paper type and for the front and back sides with the "2nd Transfer Front/Back" boxes. The default settings for normal operation are all '0'.
19. Exit the "SP Mode."

MF Model

Important

- Do the following steps 1 to 9 with the front cover of the machine open. After completing these steps, turn off the machine.

1. Open the front cover and turn on the machine.

Note

- The machine may issue an error code (because the cover is open), but continue this procedure.

2. Enter the following keys consecutively in order to enter "Engine Maintenance" in the "Maintenance Mode Menu." (If you cannot access the menu, input the sequence of keys more quickly.)
   - "Clear/Stop" → "1" → "0" → "7" → "Color/Start"
3. Select "Init Engine EEPROM" item and execute it to initialize the EEPROM.
4. Press the "Clear/Stop" key to exit the "Engine Maintenance" menu.
5. Select the "Serial No." item, and then input a serial number.

Note

- Ask your supervisor about how to access the serial number input display.

6. Exit the serial number input display, and then enter "Engine Maintenance" again.
7. Select "Destination", and then select a destination.
8. Select "Model", and then select a model.
9. Select "PnP Name", and then select a plug and play name.
10. Select "LSU Adjustment", and then input the LSU (laser optics housing unit) setting values.
11. Turn off the machine.
12. Turn on the machine with the front cover open.
13. Enter "Engine Maintenance" in the "Maintenance Mode Menu" again.
14. Close the front cover.
15. Select "Trans. Belt Adjust", and then execute "Trans. Belt Adjust" to adjust the ITB (Image Transfer Belt) unit.
16. Select "Fuser SC Detect", and then select "ON" or "OFF" for the consecutive fusing jam detection.

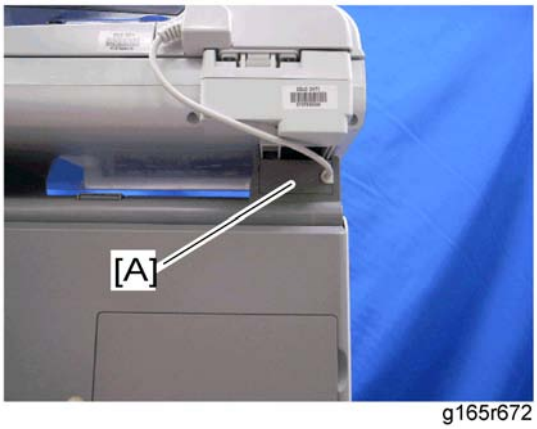
Note

- The default setting is "OFF." Select "ON" only if the customer wants to use this feature.

17. Select "Registration", and then adjust the registration for each direction (vertical and horizontal direction) and tray if necessary.
18. Select "2nd Transfer Fuser Temp" and then adjust the transfer roller bias and the temperature reduction of the fusing unit for each paper type and for the front and back sides. The default settings for normal operation are all '0'.
19. Exit "Engine Maintenance."

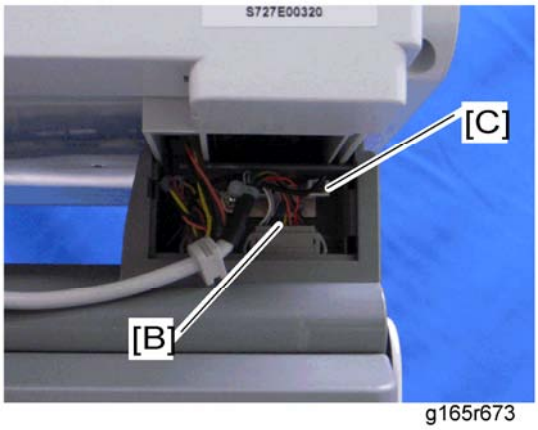
3.12 ADF

3.12.1 ADF UNIT



g165r672

1. Stand left cover [A]

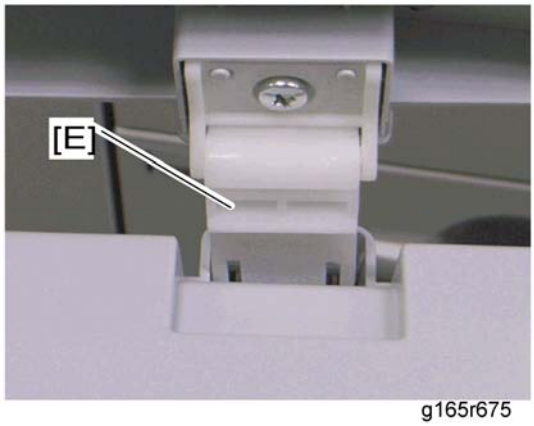


g165r673

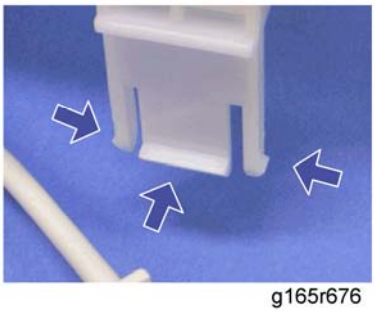
2. Disconnect the ADF harness [B] and power cord [C].

g165r674

3. Open the ADF unit [D]



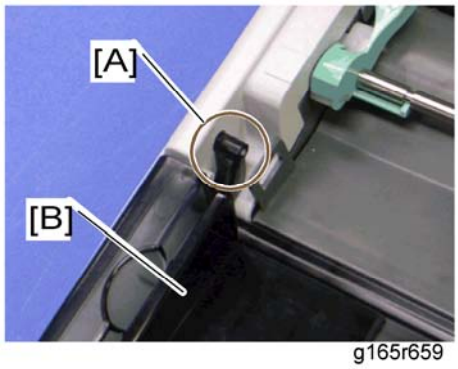
g165r675


g165r676

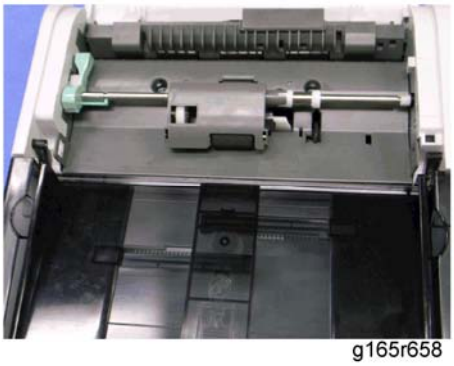
4. Release the three hooks of the right hinge [E]
5. Lift the ADF unit.

3.12.2 ORIGINAL TRAY

1. Open the ADF cover.



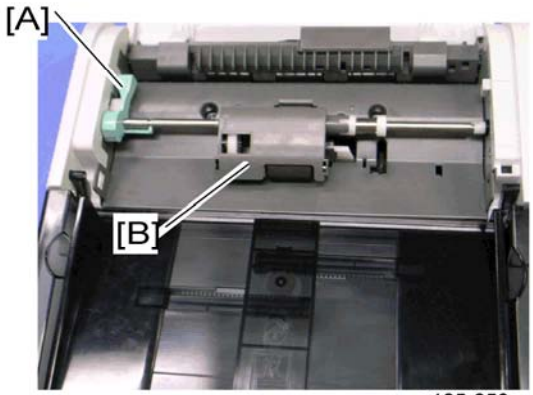
g165r659


g165r658

2. Release the front tab [A].
3. Original tray [B]

3.12.3 ADF FEED UNIT

1. Open the ADF cover.



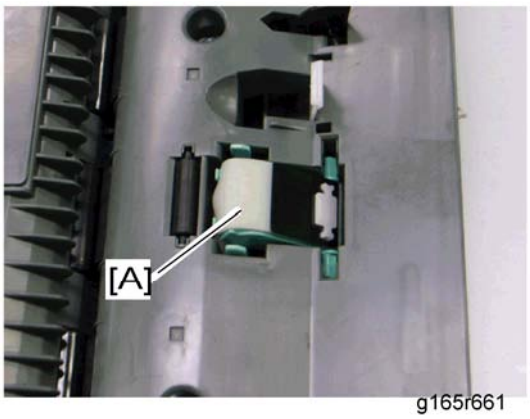
g165r658a

g165r660

2. Release the lock lever [A]
3. ADF feed unit [B]

3.12.4 ADF SEPARATION PAD

1. Open the ADF cover.
2. ADF feed unit (☛ ADF Feed Unit)

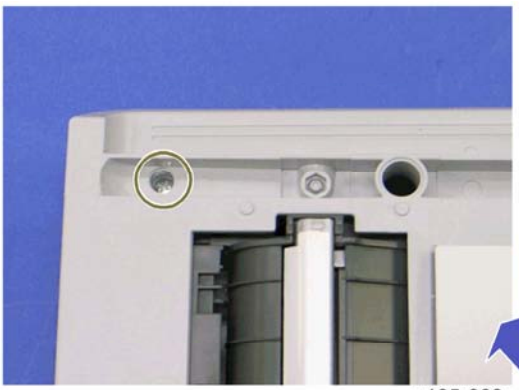


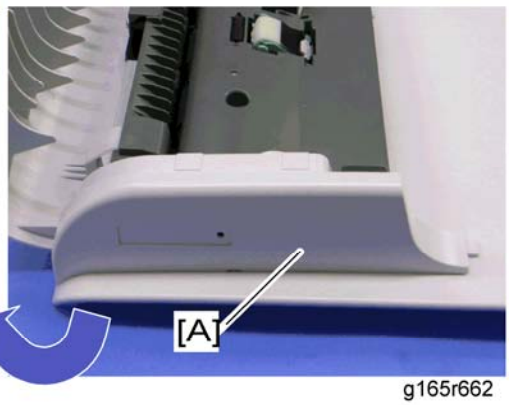
g165r661

3. ADF separation pad [A] (hook x 2, spring x 1)

3.12.5 ADF FRONT COVER

1. ADF unit (☛ ADF Unit)
2. Original Tray (☛ Original Tray)
3. ADF feed unit (☛ ADF Feed Unit)


g165r663

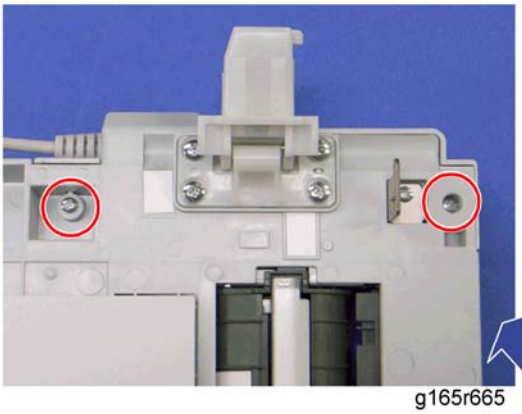


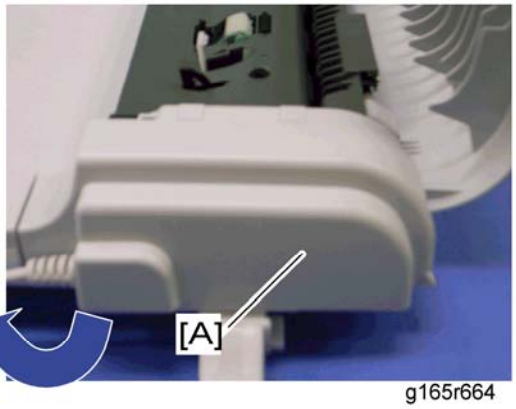
g165r662

4. ADF front cover [A] (🔩 x 1)

3.12.6 ADF REAR COVER

1. ADF unit (☛ ADF Unit)
2. Original Tray (☛ Original Tray)
3. ADF feed unit (☛ ADF Feed Unit)


g165r665

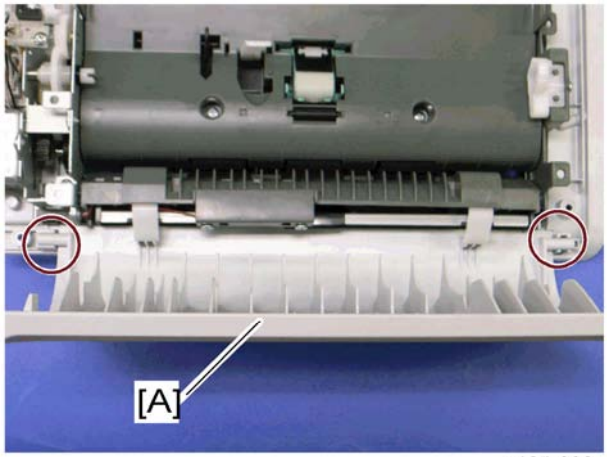


g165r664

4. ADF rear cover [A] (🔩 x 2)

3.12.7 ADF COVER

1. ADF unit (☛ ADF Unit)
2. ADF front cover (☛ ADF Front Cover)
3. ADF rear cover (☛ ADF Rear Cover)

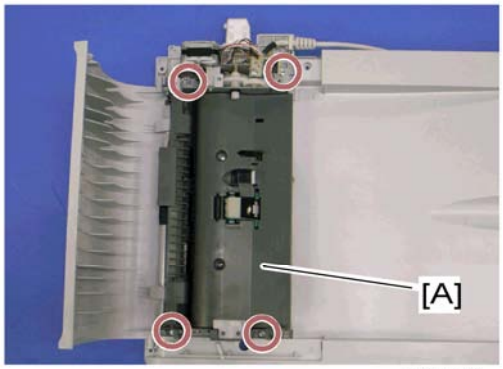


g165r666

4. ADF top cover [A] (two tabs)

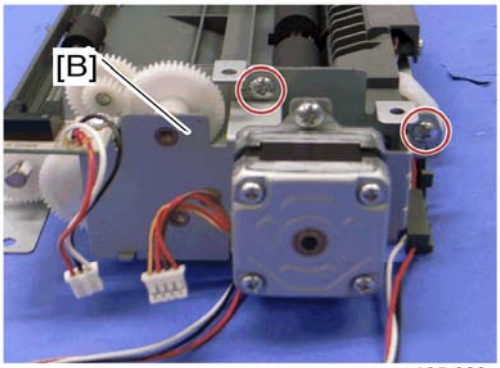
3.12.8 ADF MOTOR

1. ADF unit (☛ ADF Unit)
2. Original Tray (☛ Original Tray)
3. ADF feed unit (☛ ADF Feed Unit)
4. ADF front cover (☛ ADF Front Cover)
5. ADF rear cover (☛ ADF Rear Cover)
6. ADF drive unit [A] (x 4, all s)



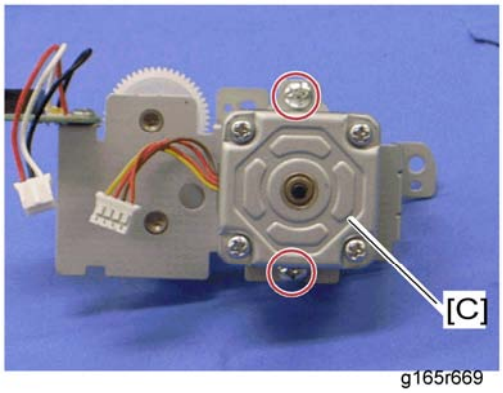
g165r667

7. ADF motor assembly [B] (x 2)



g165r668

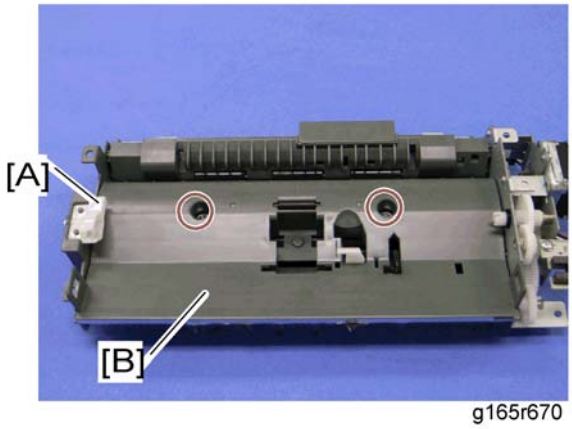
8. ADF motor [C] (x 2)



g165r669

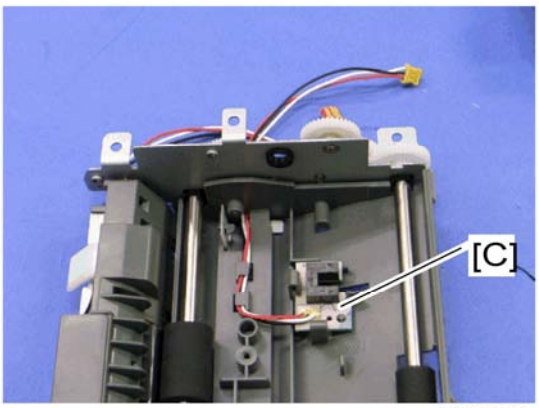
3.12.9 ORIGINAL SET SENSOR

1. ADF unit (☛ ADF Unit)
2. ADF feed unit (☛ ADF Unit)
3. ADF motor assembly (☛ ADF Motor)



g165r670

4. Feed roller holder [A] (☞ x 1)
5. Upper guide [B] (☞ x 2)

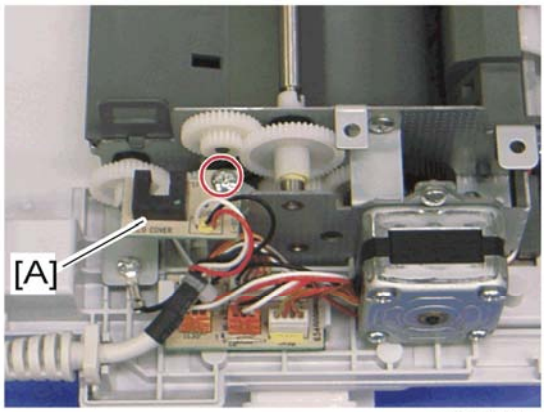


g165r671

6. Original set sensor [C] (hooks)

3.12.10 ADF COVER OPEN SENSOR

1. Original tray (☛ Original Tray)
2. ADF rear cover (☛ ADF Rear Cover)

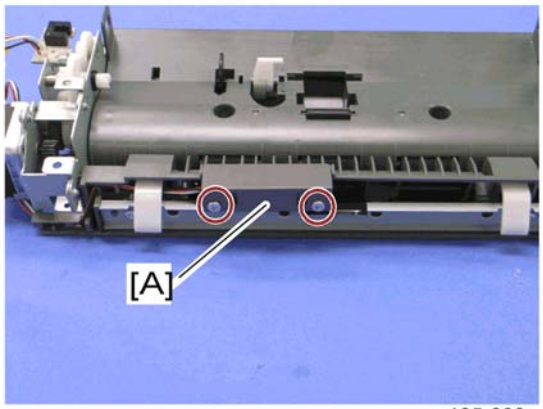


g165r679

3. ADF cover open sensor (🪛 x 1, 🤚 x 1)

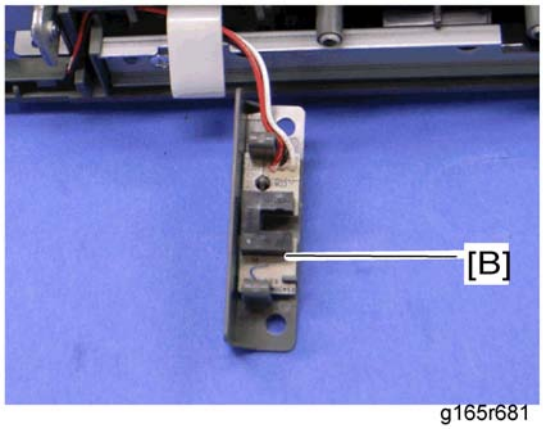
3.12.11 ADF FEED SENSOR

1. ADF unit (☛ ADF Unit)
2. ADF feed unit (☛ ADF Unit)



g165r680

3. Sensor cover [A] (🔩 x 2)

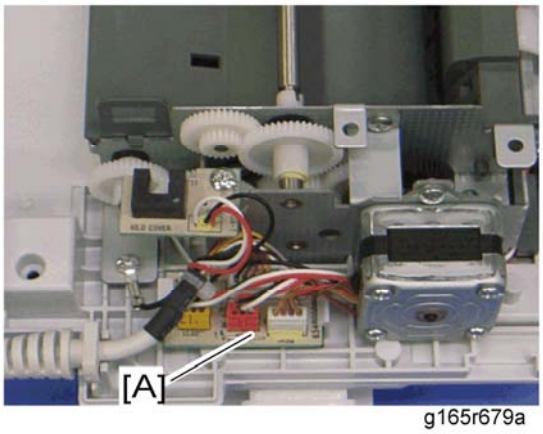


g165r681

4. ADF feed sensor [B] (hooks)

3.12.12 ADF DRIVE BOARD

1. Original tray (☛ Original Tray)
2. ADF rear cover (☛ ADF Rear Cover)



g165r679a

3. ADF drive board [A] (all ☞s, hooks)

3.13 SCANNER

3.13.1 SCANNER UNIT

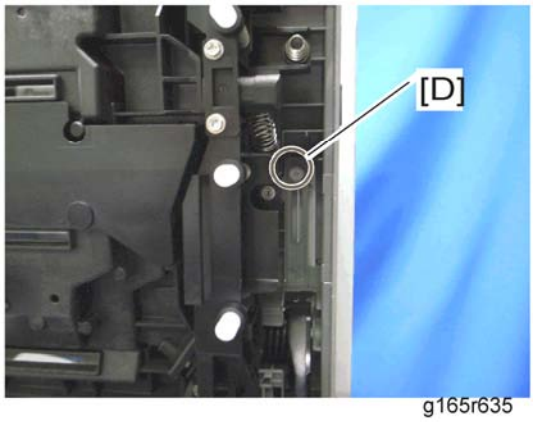
1. Controller box cover (☛ Controller Box Cover)

g165r633

2. Disconnect the flat cable [A].
3. Stand left cover [B] and right cover [C] (1 hook each)

g165r634

4. Disconnect the scanner harness, power cord and ground cable (and the ADF harness and power cord if the ADF is installed in the scanner unit) (☞ x 1).
5. Open the top cover of the machine.



g165r635

6. Remove the stepped screw [D].

g165r636

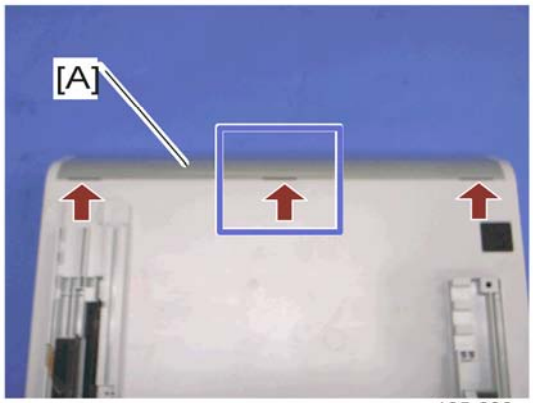
7. Push the lock button [E] and slide the scanner unit to the rear.
8. ADF unit (☛ ADF Unit)

g165r637

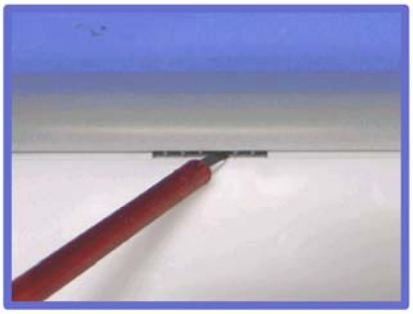
9. Scanner unit

3.13.2 SCANNER TOP COVER

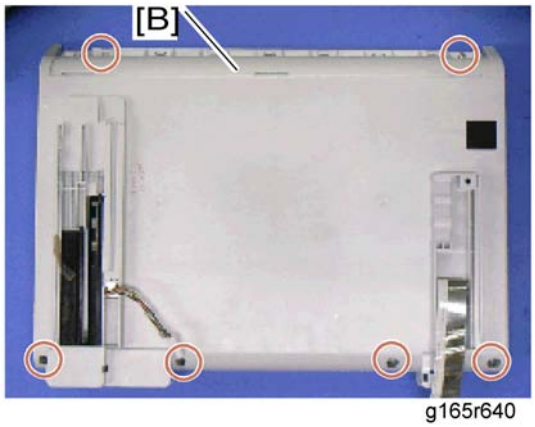
1. Scanner unit (☛ Scanner Unit)



g165r638


g165r639

2. Turn over the scanner unit.
3. Scanner front cover [A] (tabs x 3)



g165r640

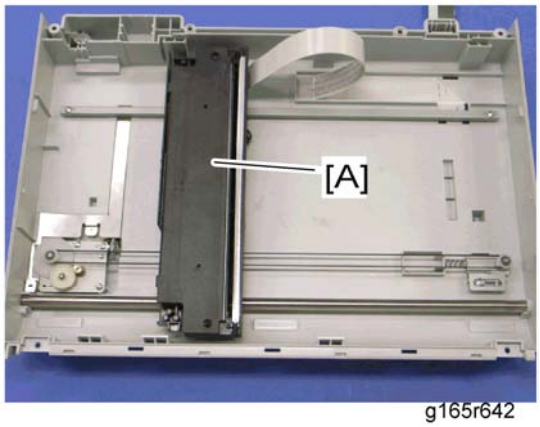
4. Remove the six screws at the bottom of the scanner base [B].

g165r641

5. Scanner top cover [C]

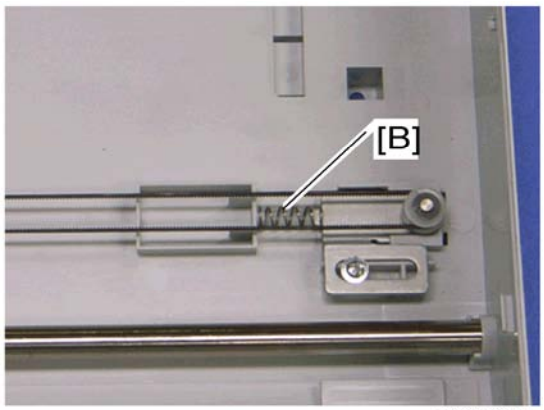
3.13.3 SCANNER CARRIAGE UNIT

1. Scanner unit
2. Scanner top cover



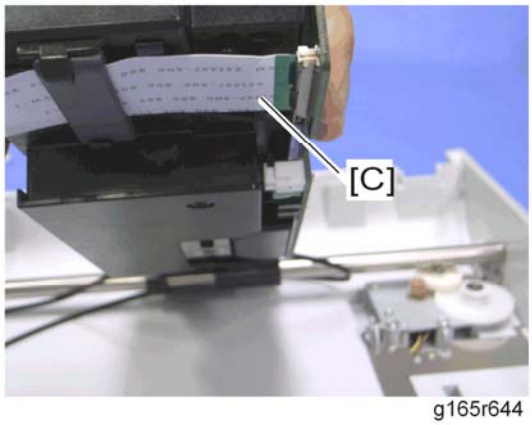
g165r642

3. Slide the scanner carriage unit [A] to the right side.



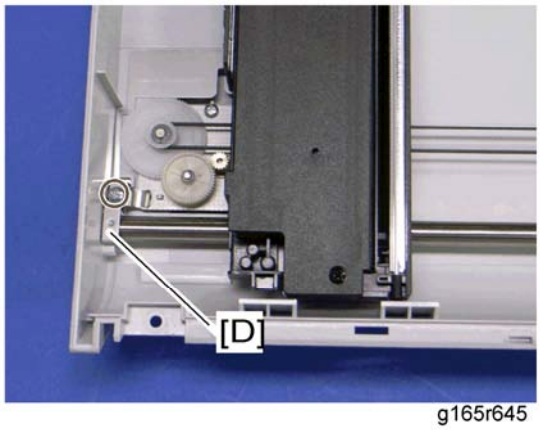
g165r643

4. Remove the timing belt tension spring [B]



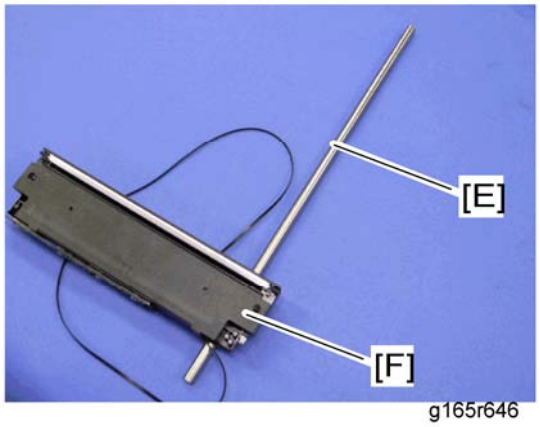
g165r644

5. Remove the flat cable [C] from the scanner carriage unit.



g165r645

6. Bar holder [D] (🔩 x 1)

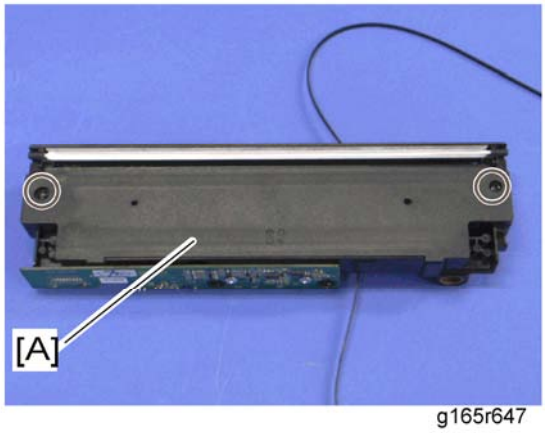


g165r646

7. Carriage bar [E] and scanner carriage unit [F]

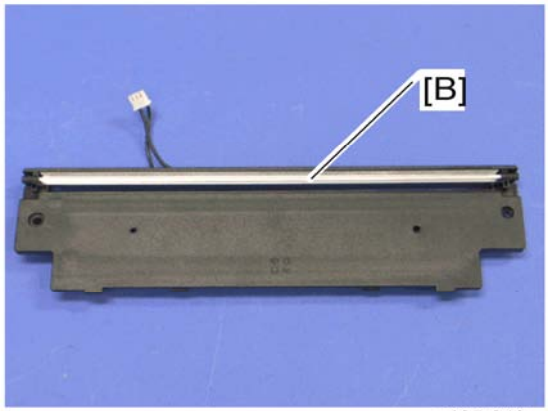
3.13.4 EXPOSURE LAMP

1. Scanner carriage unit (☛ Scanner Carriage Unit)



g165r647

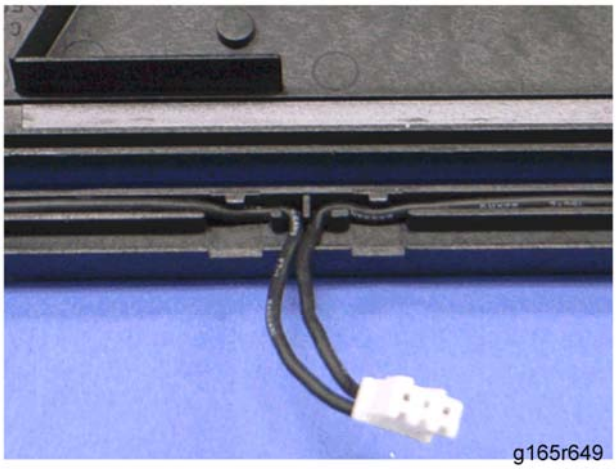
2. Carriage top cover [A] (☞ x 2, ☞ x 1)



g165r648

3. Exposure lamp [B] (hooks)

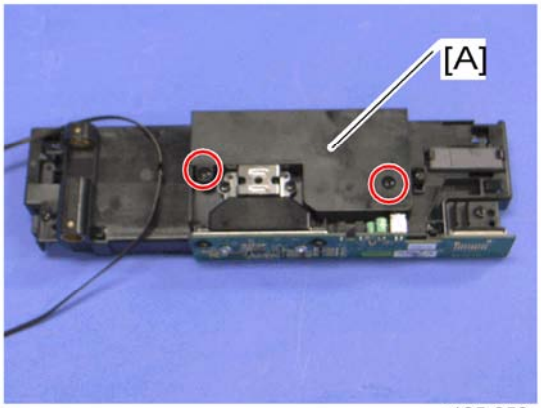
When reinstalling the exposure lamp



Wire the lamp cords as shown above. Otherwise, the top cover pinches the lamp cords and damages them when reinstalling the top cover on the scanner carriage unit.

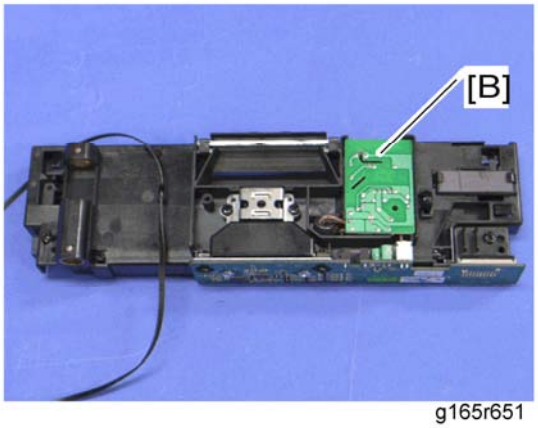
3.13.5 LAMP STABILIZER BOARD

1. Scanner carriage unit (☛ Scanner Carriage Unit)



g165r650

2. Carriage bottom cover [A] (☞ x 2)

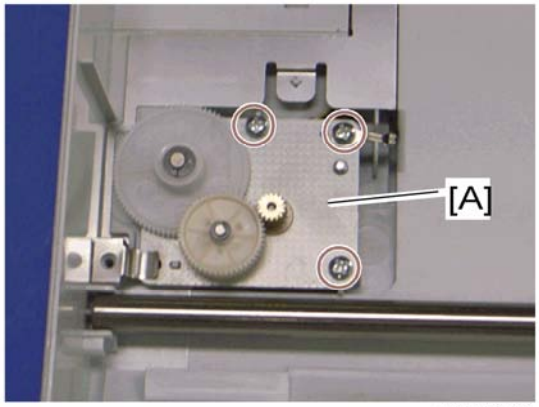


g165r651

3. Lamp stabilizer [B] (☞ x 1)

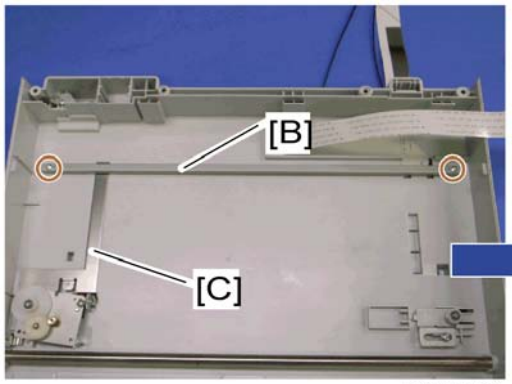
3.13.6 SCANNER MOTOR

1. Scanner carriage unit (☛ Scanner Carriage Unit)



g165r652

2. Scanner motor [A] (☞ x 3)



g165r653

g165r654

3. Carriage rail [B] (☞ x 2)
4. Ground plate [C] (double-sided tape)
5. Scanner motor

TROUBLESHOOTING

Scanner

4. TROUBLESHOOTING

4.1 ERROR CODES

4.1.1 OVERVIEW

The error codes will be displayed in the GUI of SOM (Printer model) or on the LCD (MF model) if the machine has a problem. These can be recovered by a customer.

4.1.2 ERROR CODES LIST

000	Cover Open
	The front or top cover is open.
	1. Close the front or top cover. 2. Replace the interlock switches or actuator mechanism.

010	AIO Set Error (Black)
011	AIO Set Error (Magenta)
012	AIO Set Error (Cyan)
013	AIO Set Error (Yellow)
	▪ Black AIO not set ▪ Defective connection of the ID chip terminal on the black AIO
	1. Install the AIO (black, magenta, cyan or yellow). 2. Reinstall or replace the AIO (black, magenta, cyan or yellow).

014	Waste Toner Bottle Set Error
	▪ Waste toner bottle not set ▪ Disconnected or defective harness of the waste toner bottle set sensor ▪ Defective waste toner bottle set sensor
	1. Install the waste toner bottle. 2. Check or replace the harness of the waste toner bottle set sensor. 3. Replace the waste toner bottle set sensor.

030	Tray/Paper Selection Error
	▪ No paper in the tray or tray not set in the machine ▪ Paper size requested by the job does not match the paper in the tray
	1. Install the tray or put the correct size paper in the tray. 2. Check the paper setting in the SOM (Smart Organizing Monitor) for printer models or user menu mode for MF models.

031	Paper Selection Error: Feed and Exit
	▪ Paper size requested by the job does not match the paper in the tray ▪ Selection error for the paper feed and paper exit location in duplex mode
	Check the paper feed and exit location in the SOM (Smart Organizing Monitor) for printer models or user menu mode for MF models.

050	Jam Error: No Feed from Tray 1
	▪ Paper slipped
	Remove the paper jam at tray 1.

052	Jam Error: No Feed from Optional Tray
	▪ Paper slipped
	Remove the paper jam at the optional tray (Tray 2).

055	Inner Jam Error: Registration/ Paper Exit
	A sheet of paper stays at the registration sensor or paper exit sensor. ▪ Paper slipped ▪ Paper double feed
	Remove the paper jam at the registration sensor or paper exit sensor.

056	Paper Exit Jam Error: Paper Exit/ Fusing Unit
	A sheet of paper stays at the paper exit sensor or winds around the rollers in the fusing unit. ▪ Paper slipped ▪ A sheet of paper is wound around the rollers in the fusing unit
	Remove the paper jam at the paper exit sensor or in the fusing unit.

070	Printing Error: No Paper
	▪ No paper in the tray
	Put paper in the tray.

080	Toner Near End: Black AIO
081	Toner End: Black AIO
	▪ Black toner near-end or end
	Replace the black AIO.

082	Toner Near End: Magenta AIO
083	Toner End: Magenta AIO
	▪ Magenta toner near-end or end
	Replace the magenta AIO.

084	Toner Near End: Cyan AIO
085	Toner End: Cyan AIO
	▪ Cyan toner near-end or end
	Replace the Cyan AIO.

086	Toner Near End: Yellow AIO
087	Toner End: Yellow AIO
	▪ Yellow toner near-end or end
	Replace the yellow AIO.

088	Waste Toner Bottle: Near Full
089	Waste Toner Bottle: Full
	▪ Waste toner bottle near-full or full
	Replace the waste toner bottle.

999	Color Registration (MUSIC) Error
	▪ Color registration (MUSIC) failure
	This error is not displayed even if this error occurs. It is just logged. This error is automatically recovered after the color registration (MUSIC) has been done successfully.

4.2 SERVICE CALL CONDITIONS

4.2.1 SUMMARY

This machine issues an SC (Service Call) code if an error occurs on the machine. The error code can be seen with the SOM (☛ "Smart Organizing Monitor") (printer models) or on the operation panel (MF models).

Make sure that you understand the following points;

1. All SCs are logged.
2. At first, always turn the main switch off and on if an SC code is issued.
3. Disconnect then reconnect the connectors before you replace the PCBs, if the problem concerns electrical circuit boards.
4. Check the mechanical load before you replace motors or sensors, if the problem concerns a motor lock.
5. Fusing related SCs: To prevent damage to the machine, the main machine cannot be operated until the fusing related SC has been reset by a service representative.
   - Enter SP mode (printer models) or engine maintenance mode (MF models).
   - Printer models: Click "Fuser SC Reset" in SOM, and then turn the main power switch off and on.
   - MF models: Press "OK" in "Fuser SC Reset" with engine maintenance mode, and then turn the main power switch off and on.

4.2.2 ENGINE SC

SC 1xx (Other Error)

195	Serial Number Error
	The serial number stored in the memory (EGB) is not correct.
	▪ EEPROM defective ▪ EGB replaced without original EEPROM 1. Check the serial number. 2. If the stored serial number is incorrect, contact your supervisor.

SC 2xx (Laser Optics Error)

202	Polygon motor error 1: ON timeout
	The polygon mirror motor does not reach the targeted operating speed within 5 sec. after turning on or changing speed
203	Polygon motor error 2: OFF timeout
	The polygon mirror motor does not leave the READY status within 3 sec. after the polygon motor switched off.
204	Polygon motor error 3: XSCRDY signal error
	The SCRDY_N signal remains HIGH for 200 ms while the LD unit is firing.
	▪ Polygon motor/driver board harness loose or disconnected ▪ Polygon motor/driver board defective ▪ Laser optics unit defective ▪ IPU (EGB) defective 1. Replace the interface harness of the laser optics unit. 2. Replace the laser optics unit. 3. Replace the EGB (Engine Board).

220	Laser Synchronizing Detection Error: [K]/[Y]
	The laser synchronizing detection signal for LDB [K]/[Y] is not output after the LDB unit has turned on while the polygon motor is rotating normally.
224	Laser Synchronizing Detection Error: [M]/[C]
	The laser synchronizing detection signal for LDB [M]/[C] is not output after the LDB unit has turned on while the polygon motor is rotating normally.
	▪ Disconnected cable from the laser synchronizing detection unit or defective connection ▪ Defective laser synchronizing detector ▪ Defective LDB ▪ Defective EGB 1. Check the connectors. 2. Replace the laser optics unit. 3. Replace the EGB.

240	LD error
	The IPU (EGB) detects a problem at the LD unit.
	▪ Worn-out LD ▪ Disconnected or broken harness of the LD. 1. Replace the laser optics unit.

SC 3xx (Charge Error)

300	High voltage power output error
	The measured voltage is not correct when the EGB measures each charge output (charge, development, image transfer belt unit, and transfer unit).
	▪ Disconnected or defective high voltage harness ▪ Defective high voltage power supply ▪ Defective EGB 1. Check or replace the harnesses. 2. Replace the high voltage power supply board 3. Replace the EGB.

396	Black drum motor error
	The LOCK signal error is detected when the EGB monitors the black drum motor state. (This monitoring is done immediately after power-on, when the motor starts rotating, and immediately after the motor stops.)
	▪ Disconnected or defective motor harness. ▪ Motor slips due to excessive load 1. Check the harness from the black drum motor. Replace it if necessary.
397	Color drum motor error
	The LOCK signal error is detected when the EGB monitors the color drum motor state. (This monitoring is done immediately after power-on, when the motor starts rotating, and immediately after the motor stops.)
	▪ Disconnected or defective motor harness. ▪ Motor slips due to excessive load 1. Check the harness from the color drum motor. Replace it if necessary.

SC 4xx (Image Transfer and Transfer Error)

400	Process Control Error
	This SC is issued if the process control adjustment fails 5 times consecutively after AIO replacement.
	▪ Defective contact at the terminal between the machine and AIO. ▪ Dirty TM sensor 1. Check the contact of the terminal and re-install the AIO. 2. Clean the TM sensor.

445	ITB (Image Transfer Belt) Unit: Home Position Error
	The ITB contact sensor does not detect the home position of the ITB for 5 seconds after the ITB unit initialization has been done.
	ITB (Image Transfer Belt) Unit: Contact Position Error
	The ITB contact sensor does not detect the contact position of the ITB for 5 seconds after the ITB unit has moved to the contact position.
	ITB (Image Transfer Belt) Unit: No-contact Position Error
	The ITB contact sensor does not detect the home position of the ITB for 5 seconds after the ITB unit has moved to no-contact position.
	▪ Defective ITB contact motor ▪ Defective ITB contact sensor ▪ Defective ITB unit 1. Replace the ITB contact motor. 2. Replace the ITB contact sensor. 3. Replace the ITB unit.

Service Call Conditions

480	Agitator Motor Error
	The agitator motor error is detected twice for 10 msec during the initialization at power-on or after the cover is closed.
	▪ Disconnected or defective harness ▪ Defective agitator motor 1. Check or replace the harness. 2. Replace the agitator motor.

490	ITB (Image Transfer Belt) Unit Set Error
	The TM sensor does not detect the reflection from the ITB.
	▪ No ITB unit in the machine ▪ Dirty TM sensor 1. Check the installation of the ITB unit. 2. Clean the TM sensor.

SC 5xx (Motor and Fusing Error)

500	Main Motor Error
	The LOCK signal error is detected when the EGB monitors the main motor state. (This monitoring is done immediately after power-on, when the motor starts rotating, and immediately after the motor stops.)
	▪ Disconnected or defective motor harness. ▪ Motor slips due to excessive load 1. Check the harness from the main motor. Replace it if necessary.

530	LSU Fan Motor Error
	A LOCK signal is not detected for more than ten seconds while the motor START signal is on and if this error occurs twice consecutively, this SC is issued.
	▪ Disconnected or defective motor harness. ▪ Defective LSU fan motor 1. Check or replace the motor harness. 2. Replace the LSU fan motor.

531	Fusing Fan Motor Error
	A LOCK signal is not detected for more than ten seconds while the motor START signal is on and if this error occurs twice consecutively, this SC is issued.
	▪ Disconnected or defective motor harness. ▪ Defective LSU fan motor 1. Check or replace the motor harness. 2. Replace the fusing fan motor.

Service Call Conditions

541	Thermistor Error
	The thermistor output is less than 0°C for 7 seconds.
	▪ Disconnected thermistor ▪ Defective harness connection 1. Check the harness connection of the thermistor. 2. Replace the fusing unit. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

542	Print Ready Temperature Error
	▪ The heating roller temperature increase during a set time is not correct. ▪ The fusing temperature does not reach the print ready temperature within a set time after the fusing lamp has turned on.
	▪ Defective thermistor ▪ Incorrect power supply input at the main power socket ▪ Defective fusing lamp 1. Check the voltage of the wall outlet. 2. Replace the fusing unit 3. Replace the fusing lamp. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

543	High Temperature Detection Error
	This SC is issued if one of following conditions occurs: ▪ The thermistor (center) detects 255°C or thermistor (end) detects 245°C. ▪ The thermistor (center) detects a 3°C increment or more for five seconds at 220°C or more or the thermistor (end) detects a 4°C increment or more for five seconds at 210°C or more.
	▪ Defective I/O control (EGB) ▪ Defective EGB 1. Replace the EGB Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

545	Heating Lamp Full-Power Error
	The fusing lamp is fully-powered for a certain time while the fusing unit stays in the stand-by mode and is not rotating.
	▪ Deformed thermistor ▪ Thermistor not in the correct position ▪ Defective fusing lamp 1. Replace the fusing unit. 2. Replace the fusing lamp. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

Service Call Conditions

547	Zero Cross Error
	The zero cross signal is not detected for three seconds even though the fusing lamp relay is on after turning on the main power or closing the front door.
	▪ Defective fusing lamp relay 1. Turn the main power switch off and on. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

548	Low Temperature Error
	The center thermistor detects 100°C or less for 4 seconds.
	▪ Defective fusing lamp ▪ Defective thermistor 1. Replace the fusing unit. 2. Replace the fusing lamp. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

557	Zero Cross Frequency Error
	The detection error occurs ten times consecutively in ten zero cross signal detections. This error is defined when the detected zero cross signal is 17 or less/27 or more for 0.2 seconds.
	▪ Defective fusing lamp relay ▪ Unstable input power source 1. Check the power supply source. 2. Replace the fusing unit. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code and cannot be operated.

559	Consecutive Fusing Jam
	The paper jam counter for the fusing unit reaches 3. The paper jam counter is cleared if the paper is fed correctly. This SC is activated only when this function is enabled with "Fuser SC Detect" in the SP Mode 2 tab (printer model) or "Engine Maintenance" (MF model) (default "OFF").
	▪ Defective fusing unit ▪ Defective fusing control 1. Clear this SC to send a command after a jam removal. 2. Turn off this function after a jam removal. Important ▪ Execute "Fuser SC Reset" with SOM (printer models) or "Engine Maintenance Menu" (MF model) to recover the machine after completing the recovery procedure. Otherwise, the machine continues to issue this SC code cannot be operated.

SC 6xx (Communication and Other Error)

669	EEPROM Error
	An unexpected value exists in the initialization flag of the EEPROM
	▪ EEPROM not initialized ▪ Defective EEPROM 1. Initialize the EEPROM. 2. Replace the EEPROM. 3. Replace the EGB.

690	GAVD Communication Error
	The ID of the GAVD is not identified during initialization.
	The chip ID of the GAVD cannot be detected by the machine at power-on.
	▪ Defective EGB 1. Replace the EGB.

4.2.3 CONTROLLER SC

SC8xx

819	Service Cycle Power
	▪ Incorrect combination of EGB and controller board. ▪ An unexpected error occurs in the EEPROM on the controller board.
	▪ Controller board defective 1. Install the correct EGB and controller boards for this machine. 2. Replace the controller board

823	USB/ Network Device Error
	An interface error in the USB connection or NIB connection occurs.
	▪ Controller board defective 1. Replace the controller board.

824	EEPROM Error
	An EEPROM check error at power-on occurs.
	▪ Controller board defective 1. Replace the controller board.

827	On-Board Memory Check Error
	An on-board memory check error at power-on occurs.
	▪ Controller board defective 1. Replace the controller board.

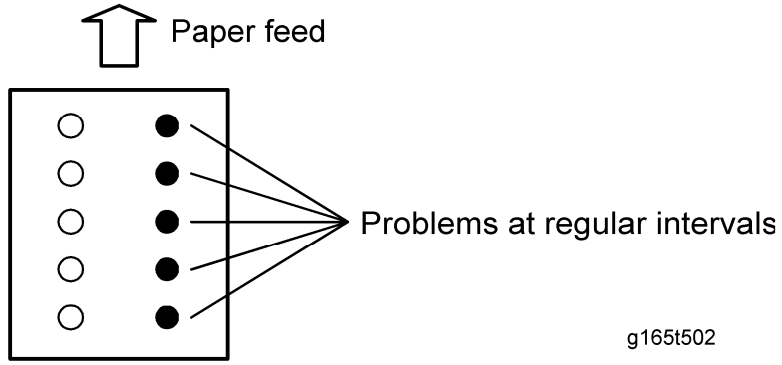
Service Call Conditions

828	ROM Checksum Error
	A ROM checksum error at power-on occurs.
	1. Replace the controller board.

4.3 IMAGE PROBLEMS

4.3.1 OVERVIEW

Image problems may appear at regular intervals that depend on the circumference of certain components. The following diagram shows the possible symptoms (black or white dots at regular intervals).



- Abnormal image at 24-mm intervals: Image transfer belt unit
- Colored spots at 38-mm intervals: AIO cartridge (Development roller)
- Abnormal image at 60-mm intervals: Transfer roller
- Colored spots at 75-mm intervals: AIO cartridge (OPC drum)
- Abnormal image at 110-mm intervals: Fusing unit (Pressure roller)
- Abnormal image at 114-mm intervals: Fusing unit (Heat roller)

4.3.2 IMAGE PROBLEM

Print out a mono-color pattern (all K, C, M, or Y), which will clarify if the cause is a problem with one of the AIOs, Image transfer belt, image transfer roller, or the fusing unit.

- Occurs with 1-3 colors: AIO unit(s) failure
- Occurs with all four colors: Image transfer belt, transfer roller or fusing unit failure

SERVICE TABLES

5. SERVICE TABLES

5.1 SERVICE PROGRAM

5.1.1 OVERVIEW

The Model PE series contains printer models and MF models. Each model type (printer model and MF model) has a different service program menu. Here is a summary.

- Printer Model

  There is no LCD on the printer models. To execute the service program, execute the SOM (Smart Organizing Monitor), which is provided with the printer driver, from your computer. For details, refer to the "Smart Organizing Monitor (Printer Model)" section.
- MF Model

  There is an LCD on the MF models. To execute the service program, access the "Maintenance Mode Menu" or "Fax Service Menu" with special key assignments. For details, refer to the "Service Menu (MF Model)" section.

For the printer models, technicians must have access to a PC in order to use the service mode.

5.2 SMART ORGANIZING MONITOR (PRINTER MODEL)

5.2.1 OVERVIEW

SOM (Smart Organizing Monitor) is a utility which can check the status of a printer and set up a printer from a PC. This utility is executed from a printer driver.

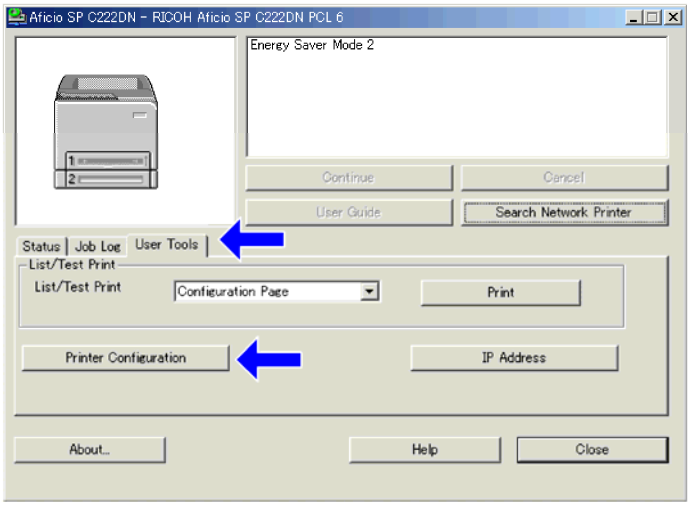
5.2.2 PRINTER DRIVER INSTALLATION (USB CONNECTION)

1. Close all applications currently running.
2. Check the following:
   - The printer's USB cable is disconnected
   - The printer's main power switch is turned off
3. Insert the CD-ROM into the CD-ROM drive.
   The installer starts.
4. Select the interface language, and then click [OK].
5. Click [DDST Printer Driver] or [PCL 6 Printer Driver].
   The software license agreement appears.
6. After reading the agreement, click [I accept the agreement.], and then click [Next >].
7. In the [Method to install printer driver] dialog box, clear the [Search for network printers.] check box, select the [Connect a printer using a USB cable.] check box, and then click [Next >].
8. Select this printer, and then click [Next >].
   A message appears, asking you to check that the USB cable is not connected and that the printer's main power switch is turned to off.
9. Check the USB cable and the printer status, and then click [Next >].
10. When the [<Auto-detect USB Port>] dialog box appears, connect this printer to the computer using a USB cable, and then turn the printer's main power switch on.
    USB auto detection begins.
11. When the dialog box asking you to use this printer as the default printer appears, click either key.
12. When a message appears informing you that the installation was successfully completed, click [Finish].

5.2.3 ENTERING THE PRINTER CONFIGURATION

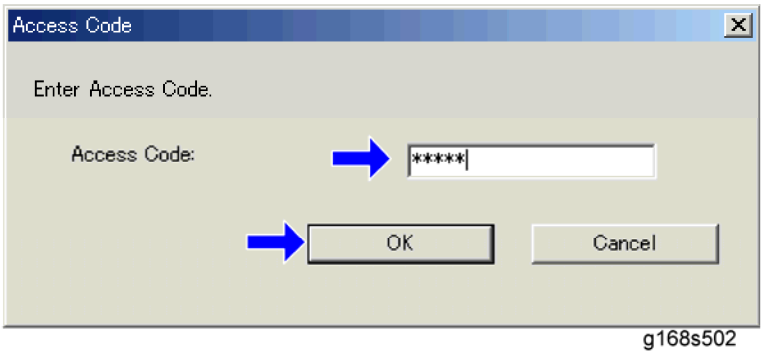
To enter the service system setting;

1. Start the SOM utility.



g168s501

2. Click the "User Tools" tab.
3. Click "Printer Configuration."
4. The "Access Code" entry dialog appears.



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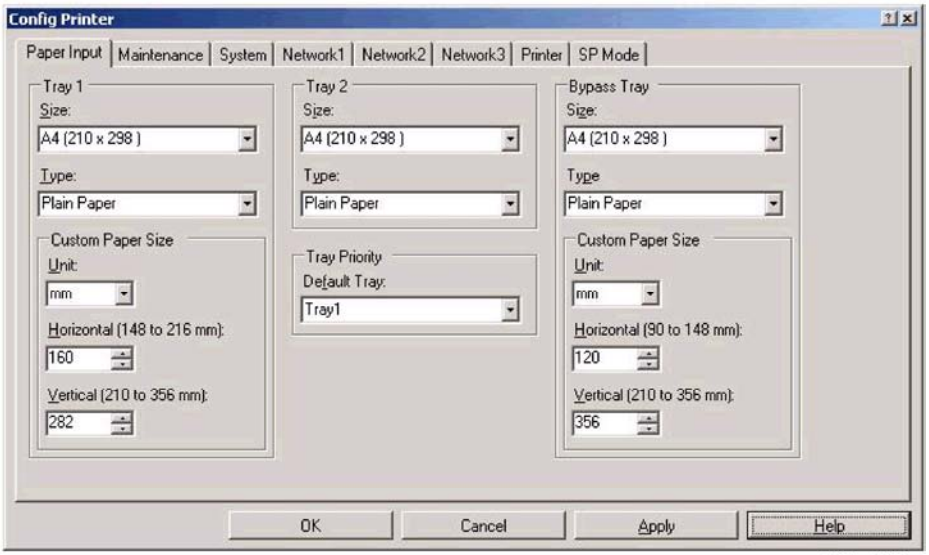
5. Input "Admin074."
6. Click the "OK" button.

Smart Organizing Monitor (Printer Model)



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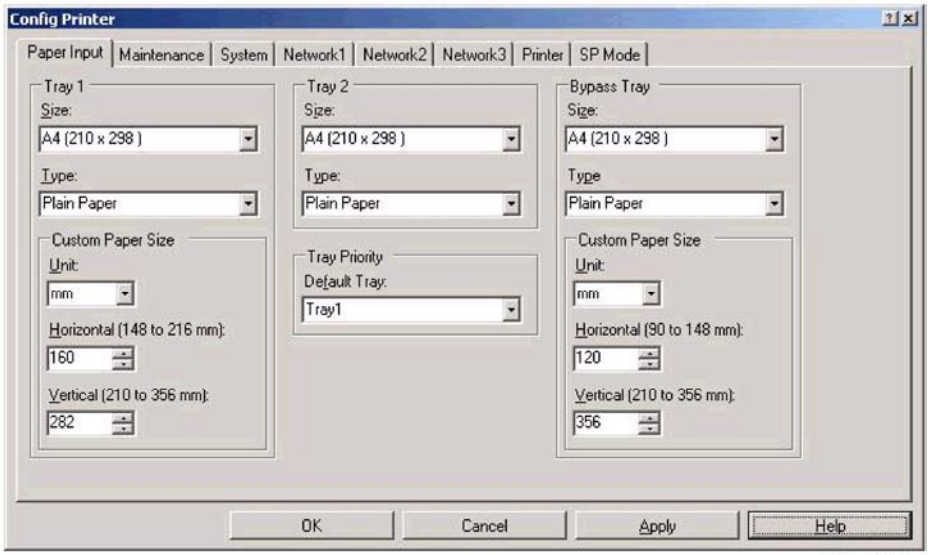
7. The "Printer Configuration" GUI appears.

5.2.4 PRINTER CONFIGURATION MENU LIST

The SOM has the following printer configuration menus. Each menu contains various setting items. The details of each setting item are explained in this section below.

Menu	Description
Paper Input	Adjusts the paper type and size settings.
Maintenance	Adjusts the image registration and executes the color registration adjustment.
System	Adjusts the system settings of the machine.
Network 1	Adjusts network settings (Information, Interface, TCP/IP).
Network 2	Adjusts network settings (IPX, SMTP).
Network 3	Adjusts network settings (SNMP, Apple Talk).
Printer	Adjusts the printer driver settings (PCL, PS).
SP mode 1	Adjusts and executes service program modes.
SP mode 2	Adjusts and executes service program modes.

Paper Input



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Item	Selections	Remarks
Tray 1 Paper Size (standard)	A4 */ B5/ A5/ B6/ A6/ Legal/ Letter*/ Half Letter/ Executive/ 8" x 13"/ 8.5" x 13"/ Folio/ Com10/ Monarch/ C5 Env/ C6 Env/ DL Env/ 16K/ Custom Paper/ Postcard/ Reply-paid Postcard/ Any size	*: Default (NA: Letter, EU: A4) The selectable paper sizes depend on the model. For details, refer to the "Supported Paper Size List."
Tray 1 Paper type (standard)	Thin Paper(60-75g/m^2)/ Plain Paper */ Plain Paper(90-105g/m^2)/ Recycled/ Color/ Preprinted/ Prepunched/ Thick Paper (105-160g/m^2)/ Letterhead/ Bond/ Cardstock/ Labels/ Envelope/ Any type	*: Default The selectable paper types depend on the model. For details, refer to the "Supported Paper Types" in the "Specifications" chapter.
Tray 2 Paper Size (optional)	A4 */ Letter *	*: Default (NA: Letter, EU: A4)

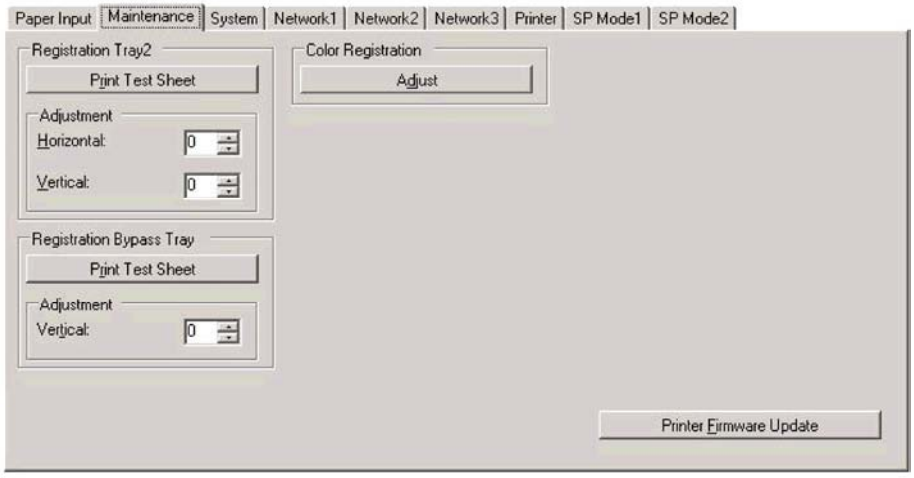
Item	Selections	Remarks
Tray 2 Paper type (optional)	Thin Paper(60-75g/m^2)/ Plain*/ Plain Paper(90-105g/m^2)/ Recycled/ Color/ Preprinted Paper/ Prepunched Paper/ Letterhead	-
Custom Size unit	Mm */ Inch *	If the paper size factory default is A4, then the custom size factory default unit is mm. If the paper size factory default is Letter, then the custom size factory default unit is inch.
Custom Horizontal	90*-216mm	3.54 – 8.50 inch. Precision is two digits after the decimal point in inch or one digit after the decimal point in mm. If an input value is more than the maximum value, then it will be treated as the maximum value. If an input value is less than the minimum value, then it will be treated as the minimum value.
Custom Vertical	148*-356mm	5.83 – 14.02 inch. Precision is two digits after the decimal point in inch or one digit after the decimal point in mm. If an input value is more than the maximum value, then it will be treated as the maximum value. If an input value is less than the minimum value, then it will be treated as the minimum value.

Smart Organizing Monitor (Printer Model)

Item	Selections	Remarks
Priority Tray	MPT	Not used
	Tray1 *	-
	Tray2	

"*" indicates the factory default value.

Maintenance



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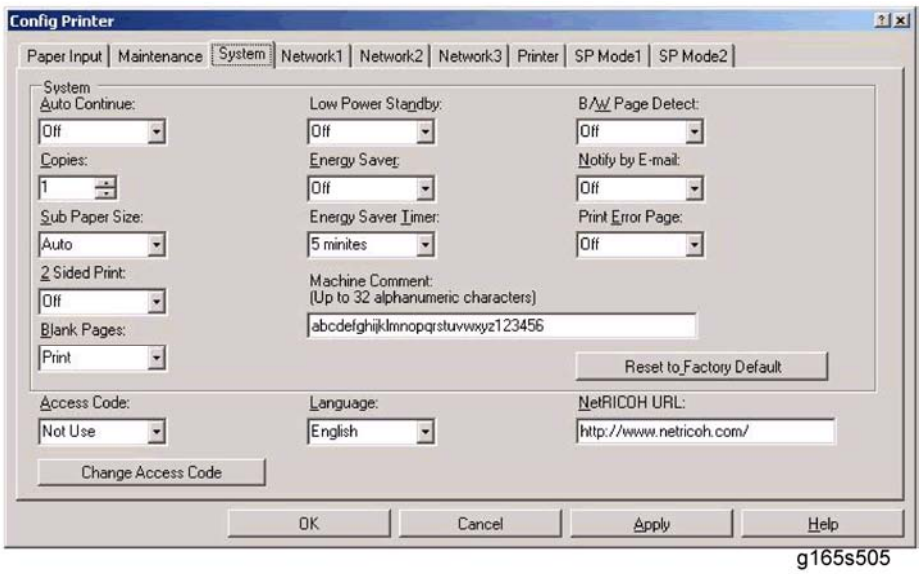
Group (Tab)	Item	Selections	Remarks
Registration Tray 2	Print Test Sheet button		Sends a PCL or GDI command to the printer to print a test sheet. It is disabled when tray 2 is not installed.
	Adjustment Horizontal	(-15 to +15) step	0.34 mm per step. Range is -5 mm to +5 mm. If the machine settings are reset to the factory defaults, this value does not change.
	Adjustment Vertical	(-15 to +15) step	0.24 mm per step. Range is -3.6 mm to +3.6 mm If the machine settings are reset to the factory defaults, this value does not change.
Registration Bypass	Print Test Sheet button		Sends a PCL or GDI command to printer to print a test sheet.
	Adjustment Vertical	(-15 to +15) step	0.24 mm per step. Range is -3.6 mm to +3.6 mm

Smart Organizing Monitor (Printer Model)

Group (Tab)	Item	Selections	Remarks
Color Registration	Adjust button		The engine will do color registration and density tuning automatically. The printer will warm up automatically after this setting is changed.
FW Update button	FW update button		This button is for updating the controller firmware. The button for updating the engine firmware is located in the "SP Mode 1" tab.

"*" indicates the factory default value.

System



g165s505

Item	Selections	Remarks
Auto Continue	On/Off *	
Copies	1*-999	PCL only. Default is 1. Always disabled in the GDI model.
Sub Paper Size	Off */ Auto	PCL. A4 Letter override
2 Sided Print	Off */ Short Edge Bind/ Long Edge Bind	PCL only
Blank Page Print	Print */ Not Print	"Manual Duplex/Cover" has higher priority than the "Blank Pages" setting.
Low Power Standby	On	
	Off *	
Energy Save	On *	
	Off	

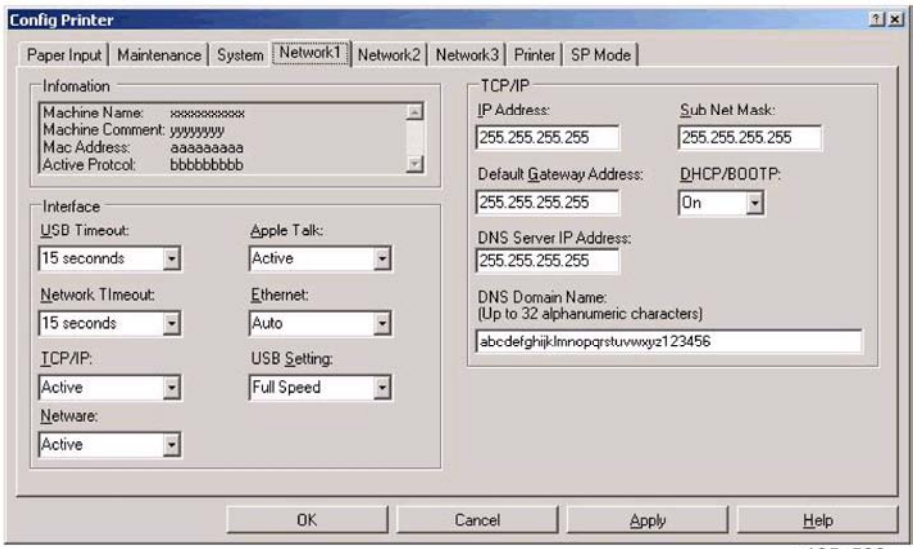
Service Tables

Item	Selections	Remarks
Energy Save Time	5min *	
	15min	
	30min	
	60min	
B/W Page Detect	On *	
	Off	
Notify by E-mail	On	
	Off *	
Print Error Page	On	PCL only
	Off *	PCL only
Machine Comment	Null string*	Up to 32 alphanumeric characters. The factory default is 'null string'.
Restore to Factory Default button		Restores all settings to the factory default settings for the market area setting.
Language	English *	Effective setting for all GDI and PDL models. The factory setting is English if the market is NA or EU or ASIA.
	French	
	German	
	Italian	
	Spanish	
	Dutch	
	Danish	

Item	Selections	Remarks
	Swedish	
	Norwegian	
	Portuguese	
	Polish	
	Czech	
	Hungarian	
	Finnish	
	Japanese	
	Simplified Chinese	
	Traditional Chinese	
	Russian	
Access Code	Used *	
	Not used	
Access code change button		Changes the access code. The button is grey if the Access code is set to "not used."
NetRicoh URL edit box	http://www.netricoh.com/*	

"*" indicates the factory default value.

Network 1



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Group (Tab)	Item	Selections	Remarks
Information	Machine Name		String length is 32
	Machine Comment		String length is 32
	Hardware Type		
	Mac Address		
	Active Protocol	TCP/IP, Netware, Apple Talk	List of 3 protocols when they are active.

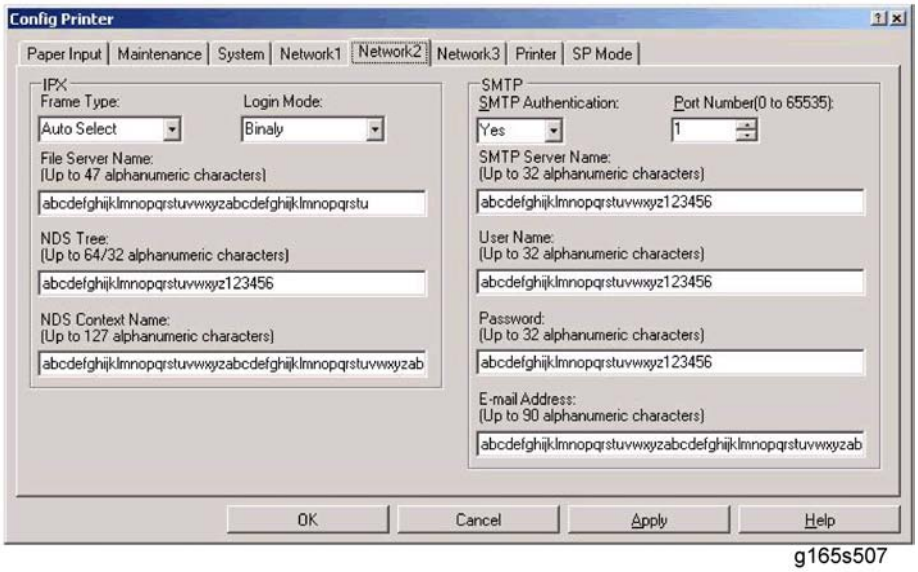
Group (Tab)	Item	Selections	Remarks
TCP/IP	IP address	xxx.xxx.xxx.xxx	This setting is not available if DHCP is enabled. If this setting is changed, the printer power must be turned off/on for the new setting to take effect. The default setting is "192.0.0.192" when DHCP is off.
	Subnet mask	xxx.xxx.xxx.xxx	This setting is not available if DHCP is enabled. If this setting is changed, the printer power must be turned off/on for the new setting to take effect. Will show all zero if network initialization is not finished. Any change will be ignored before the end of network initialization. The default setting is "255.255.255.0" when DHCP is off.
	Gateway address	xxx.xxx.xxx.xxx	This setting is not available if DHCP is enabled. If this setting is changed, the printer power must be turned off/on for the new setting to take effect. Will show all zero if network initialization is not finished. Any change will be ignored before the end of network initialization. The default setting is "192.0.0.192" when DHCP is off.

Group (Tab)	Item	Selections	Remarks
	DHCP	On */ Off	If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
	DNS Server IP Address	xxx.xxx.xxx.xxx	Up to 32 alphanumeric characters. This setting is not available if DHCP is enabled. The default setting is "0.0.0.0"when DHCP is off. The setting when DHCP is changed from on to off is the previous setting when DHCP was on. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
	DNS Domain Name		Up to 32 alphanumeric characters. This setting is not available if DHCP is enabled. The default setting when DHCP is off is null string. The setting when DHCP is changed from on to off is the previous setting when DHCP was on. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.

Group (Tab)	Item	Selections	Remarks
Interface	USB I/O Timeout	15 60 * 300	
	Network I/O Timeout	15 60 * 300	
	TCP/IP	Active* Not Active	If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
	Netware	Active* Not Active	PCL only If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
	Apple Talk	Active* Not Active	PCL only If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
	Ethernet speed	Auto* 10M half 10M full 100M half 100M full	
	USB Setting	Full Speed Auto *	If this setting is changed, the printer power must be turned off/on for the new setting to take effect.

"*" indicates the factory default value.

Network 2



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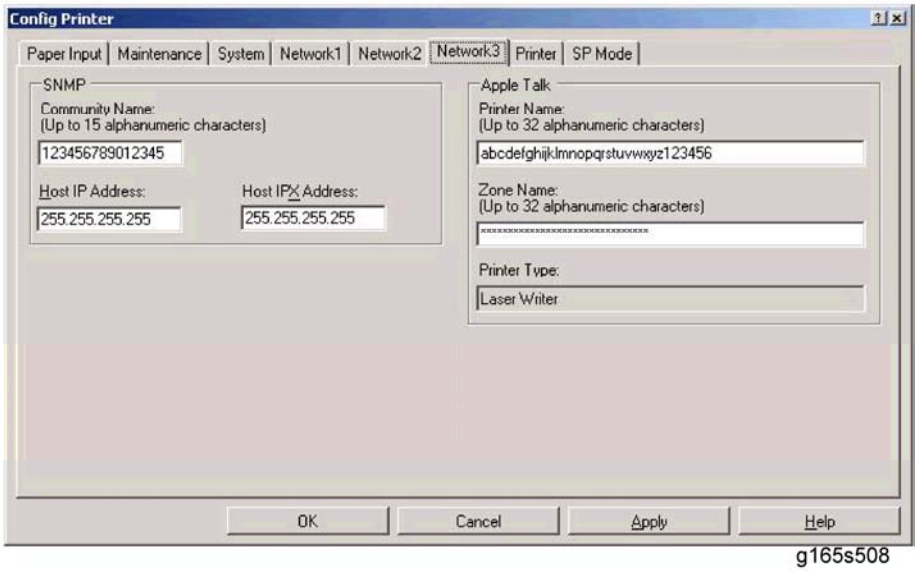
Group (Tab)	Item	Selections	Remarks
IPX	Frame Type	Auto Select*	PCL only. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
		Ethernet II	
	Login Mode	Bindery	PCL only. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
		Both	
		NDS*	
	File Server Name	Null string*	PCL only. Up to 47 alphanumeric characters. The factory default is 'null string'. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.

Group (Tab)	Item	Selections	Remarks
	NDS Tree	Null string*	PCL only. Up to 48 alphanumeric characters. The factory default is 'null string'. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
	NDS Context Name	Null string*	PCL only. Always disabled in GDI. Up to 127 alphanumeric characters. The factory default is 'null string'. If this setting is changed, the printer power must be turned off/on for the new setting to take effect.
SMTP	SMTP Authentication	Yes*	
		No	
	SMTP Server Name	Null string*	Up to 64 alpha numeric characters. The factory default is 'null string'.
	Port Number	25*	1 to 65535 The factory default is 25.
	User Name	Null string*	Up to 32 alphanumeric characters. The factory default is 'null string'.
	Password	Null string*	Up to 32 alphanumeric characters. The factory default is 'null string'. User-input characters and characters read back from the printer will show "*" in order to protect the user password.

Group (Tab)	Item	Selections	Remarks
	E-mail Address	Null string*	Up to 64 alphanumeric characters. (address for receiving e-mail) The factory default is 'null string'.
	Administrator e-mail address	Null string*	Up to 64 alphanumeric characters. The factory default is 'null string'.
	SMTP server		

"*" indicates the factory default value.

Network 3



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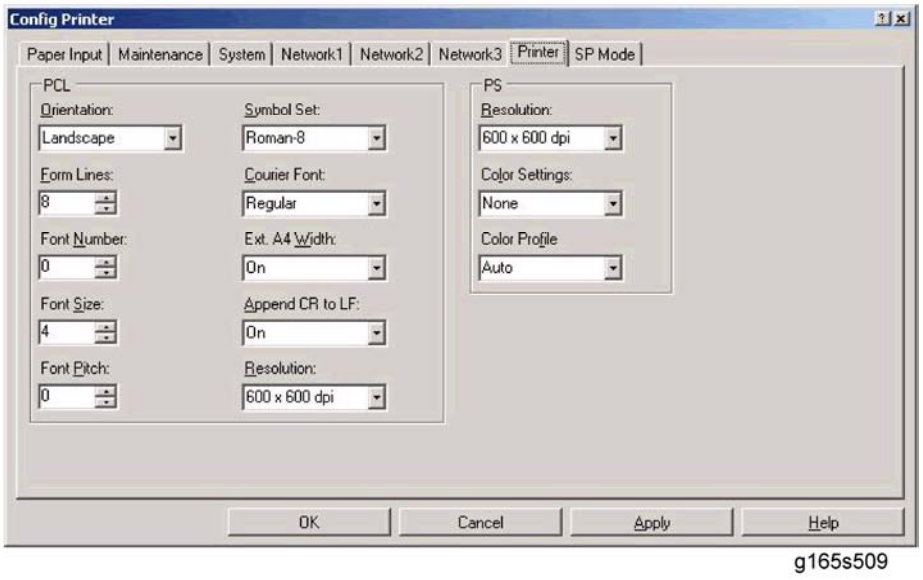
Group (Tab)	Item	Selections	Remarks
SNMP	Community Name	Null string *	Up to 15 alphanumeric characters. The factory default is 'null string'.
	Host IP Address	0.0.0.0 *	The factory default is 0.0.0.0 If this setting is changed, the printer power must be turned off/on for the new setting to take effect.

Group (Tab)	Item	Selections	Remarks
	Host IPX Address	"FFFFFFFFFFFFFFFFFFFF" *	PCL only. String length is 20. The factory default is 20 "F" characters. Valid characters are: "0123456789ABCDEFabcdef"; not case sensitive when setting but the capital character will change to lower case when reading. If this setting is changed, the printer power must be turned off/on for the new setting to take effect. A valid string length is 0 or 20. String lengths of 1 – 19 will cause the setting to be invalid. But SOM will not create an error message when the string length is in the range of 1 – 19. The invalid string can be saved at the printer side.
Apple Talk	Printer Name	"PublicWritter" *	PCL only. String of maximum length 32. The factory default string is "PublicWritter." If this setting is changed, the printer power must be turned off/on for the new setting to take effect.

Group (Tab)	Item	Selections	Remarks
	Zone Name	"*" *	PCL only. Default is "*." Up to 32 in length. The factory default string is "*." If this setting is changed, the printer power must be turned off/on for the new setting to take effect.

"*" indicates the factory default value.

Printer (PCL only)



g165s509

Group (Tab)	Item	Selections	Remarks
PCL	Orientation	Portrait *	
		Landscape	
	Form Lines	5 to 128 by 1	If the machine settings are reset to the factory defaults, this value does not change.
	Font Number	0*-89	The factory default value is 0.
	Font Size	4 to 999.75 by 0.25 (12 *)	The factory default value is 12.
	Font Pitch	0.44 to 99.99 by 0.01 (10 *)	The factory default value is 10.

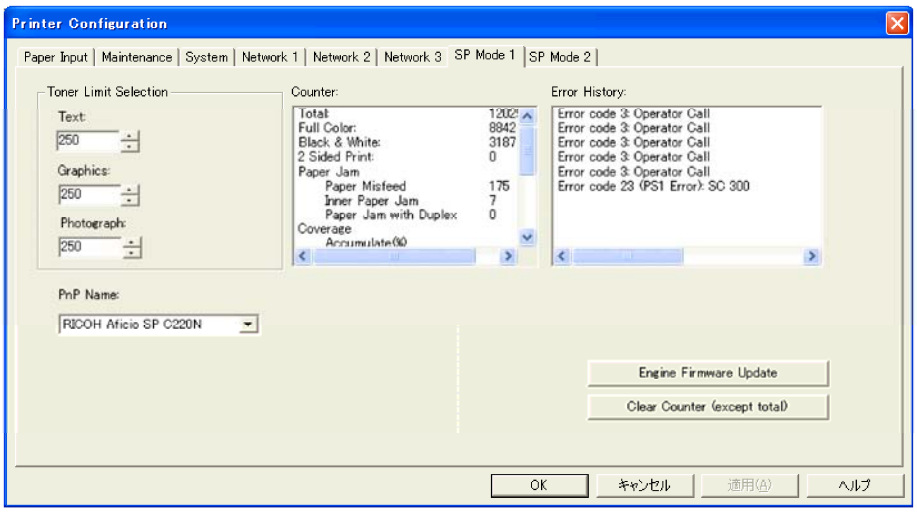
Group (Tab)	Item	Selections	Remarks
	Symbol Set	Roman-8*, Roman-9, ISO L1, ISO L2, ISO L5, PC-8, PC-8 D/N, PC-850, PC-852, PC-858, PC-8 TK, Win L1, Win L2, Win L5, Desktop, PS Text, VN Intl, VN US, MS Publ, Math-8, PS Math, VN Math, Pi Font, Legal, ISO 4, ISO 6, ISO 11, ISO 15, ISO 17, ISO 21, ISO 60, ISO 69, Win 3.0, MC Text, ISO L6, ISO L9, PC-775, PC-1004,	
	Courier Font	Regular*	
		Dark	
	Ext. A4 Width	Off*	
		On	
	Append CR to LF	Off	
		On *	

Smart Organizing Monitor (Printer Model)

Group (Tab)	Item	Selections	Remarks
	Resolution	600x600dpi 1bit*	
		600x600dpi 2bits	
		600x600dpi 4bits	
PS	Resolution	600 x 600 dpi*	
		600 x 600 dpi 2bits	
		600 x 600 dpi 4bits	
	Color Profile	Off	
		Solid color *	
		Presentation	
		Photographic	

"*" indicates the factory default value.

SP Mode 1



g165s510

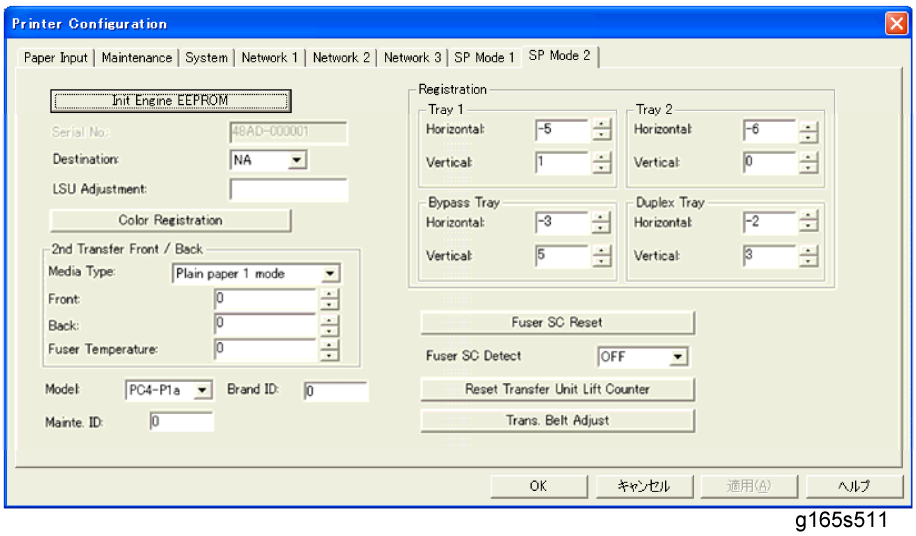
Item	Selections	Remarks
Toner Limit Selection	Text	This means "toner limit." Should by text/graphic/image. [200 to 400 / 250 (default) / 10/step]
	Graphic	
	Image	
Print Side Volume	Total	Total printed page counter
	Color	Total printed color page counter
	B/W	Total printed mono page counter
	Duplex	Total printed duplex page counter. (PDL only)
	Paper Jam - Misfeed	Misfeed jam counter [0 to 128]
	Paper Jam - Inner	Counter for jams inside the machine [0 to 128]

Smart Organizing Monitor (Printer Model)

Item	Selections	Remarks
	Paper Jam - Duplex	Duplex jam counter [0 to 128] Always 0 if the printer does not have a duplex unit.
	Recent K, M, C, Y coverage	Recent K coverage = K data got from the engine (the unit is 1024 dots) / A4 full coverage dot number (the unit is 1024 dots). A4 full coverage dot number in units of 1024 dots is 4961*7016/1024. Recent M, C, Y coverage uses the same equation as K, using the M, C, Y data from the engine.
	Accumulate K, M, C, Y coverage	Added from recent coverage. Stored in the EEPROM.
Error History	Error code listing	Maximum 16 error codes. There is nothing displayed if there is no error code. If there is only one error code, then only one error code string is displayed.
PnP Name		Select a Plug in Play name from the dropdown list. The modified setting will only take effect after the printer power is turned off/on. The printer will warm up automatically after this setting is changed.
Engine Firmware update button		Engine firmware update button

"*" indicates the factory default value.

SP Mode 2



g165s511

Item	Selections	Remarks
Init Engine EEPROM		This clears all counters except "Full Color" and "Black and White" in the total counter. When you click the [Init Engine EEPROM] button, the engine EEPROM is initialized. Turn the machine power off/on after you change this setting.
Serial No.	11 characters	Displays and changes a serial number. (Character: alphanumeric, input length: 11 bytes) The printer will warm up automatically after this setting is changed.

Item	Selections	Remarks
Destination	1 byte. 0:DOM (JPN), 1:NA, 2:EU, 3:China, 4:Taiwan, 5:AP, 6:LA	Displays and changes a destination. It may damage the printer if you change this setting. Turn the machine power off/on after you change this setting. The printer will warm up automatically after this setting is changed. SOM will show a blank space if the printer destination setting is unknown.
LSU Adjustment	Input 160 bytes setting.	Character: alphanumeric "0-9", "a-f", "A-F", only valid data can be input. Input length: 160 bytes
Color Registration button		The engine will do color registration and density tuning automatically. The printer will warm up automatically after this setting is changed.
2nd Transfer Front / Back		

Item	Selections	Remarks
Media type	Display string only 0: Plain paper 1 mode 1: Plain paper 2 mode 2: Plain paper 3 mode 3: Reserved (not display) 4: Thick stock 1 mode 5: Thick stock 2 mode 6: Thick stock 3 mode (Not used) 7: Thick stock 4 mode 8: Envelope 1 mode	Please select the media type.
Front	(-15 to +15)	This adjusts the transfer roller current, based on the default value. The range of adjustment is from -15 [μA] to +15 [μA], in units of 1. The printer will warm up automatically after this setting is changed.
Back	(-15 to +15)	This adjusts the transfer roller current, based on the default value. The range of adjustment is from -15 [μA] to +15 [μA], in units of 1. Printer will warm up automatically after this setting is changed.
Fuser Temperature	(-30 to 0)	This adjusts the temperature of the fusing unit, based on the default value. The range of adjustment is from -30 [°C] to 0[°C], the unit is 2. The printer will warm up automatically after this setting is changed. *2

Smart Organizing Monitor (Printer Model)

Item	Selections	Remarks
Model	Display string only 1: PE-P1a 2: PE-P1b 3: PE-P1c	Displays the current model in a dropdown list. Do not change this setting (Designed for Factory Use).
Brand ID	00* – 7F	Displays the current brand ID number. Do not change this setting (Designed for Factory Use).
Mainte. ID	00* – 7F	Displays the current maintenance ID number. Do not change this setting (Designed for Factory Use).
Registration		
Tray1	Horizontal	1.32mm per step. Range is -15mm to +15mm. If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.
	Vertical	0.24mm per step. Range is -3.6mm to +3.6mm If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.

Item	Selections	Remarks
Tray2	Horizontal (-15 to +15) step	1.32mm per step. Range is -5mm to +5mm. If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.
	Vertical (-15 to +15) step	0.24mm per step. Range is -3.6mm to +3.6mm If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.
Bypass Tray	Horizontal	1.32mm per step. Range is -5mm to +5mm. If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.
	Vertical	0.24mm per step. Range is -3.6mm to +3.6mm If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.

Item	Selections	Remarks
Duplex Tray	Horizontal (-15 to +15) step	1.32mm per step. Range is -5mm to +5mm. If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.
	Vertical (-15 to +15) step	0.24mm per step. Range is -3.6mm to +3.6mm If the machine settings are reset to the factory defaults, this value does not change. The printer will exit the energy saver state after this setting is changed.
Fuser SC Reset		This button is for resetting an SC related with the fusing errors.
Fuser SC Detect	On/Off	If On, the engine detects SC559. If Off, the engine does not detect "Fusing SC Reset."
Reset Transfer Unit Life Counter		Resets the transfer unit life counter.
Trans. Belt Adjust		When you click the [Trans. Belt Adjust] button, the transfer belt adjustment is done. This calibrates the motor speed to match the length of the new transfer belt.

"*" indicates the factory default value.

5.3 SERVICE MENU (MF MODEL)

5.3.1 OVERVIEW

The MF model has several service menus. Each service menu has several adjustment items. This section explains how to enter each service menu and what you can do in each service menu.

Each menu is classified into two "Modes" depending on how you enter the service menus.

- "Menu Mode" can be executed by pushing a sequence of keys.
- "Special Mode" can be executed if you press certain keys at the same time as you turn the power on.

Each menu is classified as follows:

Menu Mode	
Maintenance Mode Menu	This is a menu for maintenance and service.
Special Mode	
Reseller Default Settings Menu	This is a menu for initializing all information stored in the controller, except for some counters. ▪ These counters are initialized: Print/Scan/Copy/Fax functional Counter, Jam Counter ▪ These counters are not initialized: Printer/Scanner Engine Counter, which are printed in the "Configuration Page." After initializing with this menu, when the user powers on the machine, the Initial Setup Menu appears. The user must select Language in Country in this menu.
Fax Service Test Menu	This is a menu for checking the fax mode.

5.3.2 MAINTENANCE MODE MENU

Entering the Maintenance Mode Menu

1. Turn on the machine.
2. Press these keys in the following order:
   "Clear/Stop", "1", "0", "7" and "Color Start"
3. "Maintenance Mode" is displayed on the LCD.

Selecting an Item

To select an item, press the "Up" or "Down" key.

Going into the Next Level/ Returning to the Previous Level

- To go into the next level of an item, select an item then press the "OK" key.
- To return to the previous level of an item, press the "Return" key.

Exiting the Maintenance Mode Menu

To exit the maintenance mode menu, press the "Clear/Stop" or "Return" key until the "Ready" display appears.

Menu List

Display Info		
Model Name		Displays the Model Name, Depends on Engine Firmware Settings
FW Ver.	CTL FW Ver.	Displays the Firmware Version
	FAX FW Ver.	Displays the PDL Firmware Version. (G181 doesn't support this)
	MCTL FW Ver.	Displays the Engine Firmware Version
	PDL FW Ver.	Displays the PDL Firmware Version. (G183/184)
Counter	Printer Counter	Displays the following counters of the printer engine. Total Page/ Color Image/ Black Image

	Scanner Counter	Displays the sum total of scanner counters for each mode. Total Page/ Black Page/ Color Page / ADF Used
	Jam Counter	Displays the number of paper jams at each location. Total/ ADF/ Printer Output Bin/ Internal/ Tray1 / Tray2
	Coverage	Displays the number of paper misfeeds with tray 1 or tray 2. Coverage1 (Tray 1)/ Coverage2 (Tray2)

Print Reports	
G3 Protocol dump list	G3 protocol dump of the latest communication is printed. (G181 doesn't support this) Off (Default)/ Error/ On

Engine Maintenance	
Init Engine EEPROM	This clears all counters except "Full Color" and "Black and White" in the total counter. When you execute "Init Engine EEPROM", the engine EEPROM is initialized. Turn the machine power off/on after you change this setting.
Model	Displays only 1: PE-P1a 2: PE-P1b 3: PE-P1c Displays the current model in a dropdown list. Do not change this setting (Designed for Factory Use).

Brand ID	00* – 7F Displays the current brand ID number. Do not change this setting (Designed for Factory Use).	
Maintenance ID	00* – 7F Displays the current maintenance ID number. Do not change this setting (Designed for Factory Use).	
LSU Adjustment	Input 160 bytes setting.	Character: alphanumeric "0-9", "a-f", "A-F", only valid data can be input. Input length: 160 bytes
Trans. Belt Adjust	When you execute "Trans. Belt Adjust", the transfer belt adjustment is done. This calibrates the motor speed to match the length of the new transfer belt.	
Fuser SC Detect	On/Off*	If On, the engine detects SC559. If Off, the engine does not detect "Fusing SC Reset."
Color Registration	The engine will do color registration and density tuning automatically. The printer will warm up automatically after this setting is changed.	
Reset Transfer Unit Life Counter	Resets the transfer unit life counter.	
Fuser SC Reset	This button is for resetting an SC related with the fusing errors.	

Toner Limit	Text	Determines the maximum amount of ink/toner you can use in any area of your text. This is where you are controlling exactly how much ink will be used during printing. [200 to 400 / 250 (Default)/ 10/step] Setting 0: Off
	Graphic	Determines the maximum amount of ink/toner you can use in any area of your graphic. This is where you are controlling exactly how much ink will be used during printing. [200 to 400 / 250 (Default)/ 10/step] Setting 0: Off
	Image	Determines the maximum amount of ink/toner you can use in any area of your image. This is where you are controlling exactly how much ink will be used during printing. [200 to 400 / 250 (Default)/ 10/step] Setting 0: Off
P_NP Name	NA Model: RICOH/ 'nul' EU Model: RICOH/ NRG/ LANIER ASIA Model: RICOH/ LANIER China Model: RICOH	
Destination	Sets the destination and updates the engine setting. JPN/ NA (Default)/ EU/ ASIA/ China	

2nd Transfer Fuser Temp.	2nd Transfer Front	Adjusts the transfer roller current, based on the default value. [-15 to 15 / 0 (Default) / 1 μA/step]
	2nd Transfer Back	Adjusts the transfer roller current, based on the default value. [-15 to 15 / 0 (Default) / 1 μA/step]
	Fuser Temperature	Adjusts the temperature of the fusing unit, based on the default value. [-30 to 0 / 0 (Default) / 2°C/step]
Registration	Horiz. Tray1	Adjusts the horizontal registration for tray 1. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 4 mm/step]
	Vert.Tray1	Adjusts the vertical registration for tray 1. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 0.24 mm/step]
	Horiz.Tray2	Adjusts the horizontal registration for tray 2. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 4 mm/step]
	Vert.Tray2	Adjusts the vertical registration for tray 2. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 0.3 mm/step]
	Horiz.Bypass	Adjusts the horizontal registration for the bypass tray. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 4 mm/step]

	Vert.Bypass	Adjusts the vertical registration for the bypass tray. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 0.3 mm/step]
	Horiz.Dup.Back	Adjusts the horizontal registration for the back side in duplex mode. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 4 mm/step]
	Vert.Dup.Back	Adjusts the vertical registration for the back side in duplex mode. If the machine settings are reset to the factory defaults, this value does not change. [-15 to 15 / 0 (Default) / 0.3 mm/step]
Reset Count	Resets counters to factory defaults.	
Clear Count	Clears the Scanner and Jam Counters.	
Replace Fuser	Resets the maintenance counter for the fusing unit. This item appears only when the fusing unit life is almost expired or has expired.	

Scan Maintenance		
Mono Compression Setting	Sets the monochrome compression type for scanning. MH (Default)/ MR/ MMR	
Regist Adjust	ADF Main Reg.	Adjusts the ADF Scan main-scan registration. (G181 doesn't support this.) [-2.0 to 2.0 / 0 (Default)/ 0.1 mm/step]
	ADF Sub Reg.	Adjusts the ADF Scan sub-scan registration. (G181 doesn't support this.) [-2.0 to 2.0 / 0 (Default)/ 0.1 mm/step]

	Flatbed Main Reg.	Adjusts the Flatbed Scan main-scan registration. (G181 doesn't support this.) [-2.0 to 2.0 / 0 (Default)/ 0.1 mm/step]
	Flatbed Sub Reg.	Adjusts the Flatbed Scan sub-scan registration. (G181 doesn't support this.) [-2.0 to 2.0 / 0 (Default)/ 0.1 mm/step]
Size Adjust	ADF Main Reg.	Adjusts the ADF Scan main-scan magnification. (G181 doesn't support this.) [-0.9 to 0.9 / 0 (Default)/ 0.1 %/step]
	ADF Sub Reg.	Adjusts the ADF Scan sub-scan magnification. (G181 doesn't support this.) [-0.9 to 0.9 / 0 (Default)/ 0.1 %/step]
	Flatbed Main Reg.	Adjusts the Flatbed Scan main-scan magnification. (G181 doesn't support this.) [-0.9 to 0.9 / 0 (Default)/ 0.1 %/step]
	Flatbed Sub Reg.	Adjusts the Flatbed Scan sub-scan magnification. (G181 doesn't support this.) [-0.9 to 0.9 / 0 (Default)/ 0.1 %/step]

Fax Maintenance (G181 doesn't support this.)		
Modem Settings	RX Level	Sets the reception level. [-43 dBm (Default)/ -33 dBm/ -26 dBm / -16 dBm]
	TX Level	Sets the transmission level. [0 dBm/ -1 dBm/ -2 dBm/ -3 dBm/ -4 dBm / -5 dBm/ -6 dBm/ -7 dBm/ -8 dBm/ -9 dBm / -10 dBm/ -11 dBm/ -12 dBm/ -13 dBm / -14 dBm/ -15 dBm]

	Cable Equalizer	These selectors are used to improve the pass-band characteristics of analogue signals on the telephone line. [0Km (Default)/ 1.8Km/ 3.6Km/ 7.2Km]
Protocol Definition	Training Retries	This sets the number of training retries to be repeated before automatic fallback. [1 Time/ 2 Times (Default)/ 3 Times/ 4 Times]
	Encoding	Sets the compression method for Tx/Rx. [MMR+MR+MH (Default)/ MR+MH/ MH]
Protocol Definition Timer	T0 Timer	Timeout for response from the called station in automatic sending mode [35 Sec/ 45 Sec/ 55 Sec (Default)/ 60 Sec/ 90 Sec/ 140 Sec]
	T1 Timer	Set the time length for the T1 timer. [40 Sec (Default)/ 50 Sec]
	T4 Timer	Set the time length for the T4 timer. [3 Sec (Default/ 4.5 Sec]
RX Settings	Silence Detection Time	Silence (No tone) detection time (Rx mode : FAX/ TAD Only) After the line is connected via the external telephone, the machine can detect silence (no tone) for the time length specified by this setting. [30 sec (Default)]
	CNG Tone Detection Time	CNG tone detection time (RX mode : FAX / TEL, FAX / TAD Only) After the line is connected via the external telephone, the machine can detect a CNG signal for the time length specified by this setting. [5 Sec (Default)/ 10 Sec]

	CNG Cycles	Number of CNG cycles to be detected This setting is only effective for FAX/TAD mode. [1.5 Cycle (Default)/ 2.0 Cycle]
	Tone Sound Monitoring	Determines the period when tones from the line are monitored. [No Monitoring/ Up To Phase B (Default)/ All TX Phases]
	Stop/Clear key	Pressing the Stop/Clear key can stop the current receiving operation. Received data is lost. [Not Functional (Default)/ Functional]
	Off-Hook Level	Sets the off-hook detection threshold. [10V (Default)/ 15V/ 20V/ 25V]
TX Settings	Redial Interval	Sets the redial interval when Tx fails. [5 Min/ 6 Min]
	Redialings	Sets the number of redials when Tx fails. [2 times/ 3 Times/ 4 Times/ 5 Times]
Overseas Comm Mode Settings	Overseas Comm Mode	This sets the machine to ignore a DIS signal sent from the called station once in a sending operation. [Off (Default)/ Ignore DIS Once]
	Minimum Time Length	If this setting is set to "On", the machine detects the CNG signal after the line is connected. If it is set to "Off", the machine detects the CNG signal as long as the line is connected. [100 Ms/ 200 Ms/ 300 Ms/ 400 Ms (Default)]

Dial Pulse Setting	Dial Pulse Type	This sets the number of pulses that are generated during dialing. ▪ N: Dialing '0' generates 10 pulses --- Dialing '9' generates 9 pulses. ▪ N+1: Dialing '0' generates 1 pulse --- Dialing '9' generates 10 pulses. ▪ 10-N: Dialing '0' generates 10 pulses --- Dialing '9' generates 1 pulse.
Tone Signal Settings	Tone Signal Transmission Time Length	Sets the tone signal transmission time length [100 ms (Default)]
	Minimum Pause In Tone Dialing	Sets the minimum pause during tone dialing [100 ms (Default)/ 150 ms/ 200 ms]
	Attenuator For Pseudo Ring Back tone To the Line	Sets the attenuator for pseudo ring back tone to the line [0 to 15 / 10 (Default)/ 1 dB/step]
	DTMF Level	Sets the transmission level of DTMF tones. [-12 dBu / -11 dBu/ -10 dBu/ -8 dBu/ -6 dBu]
	DTMF Delta	Sets the level difference between high band frequency signals and low band frequency signals when sending DTMF tones. [2 dBu/ 3 dBu]
1Dial Tone Detection	Wait Time	The machine starts dialing after the specified interval without detection of a dial tone when Dial tone detection is set to "No detection." [3.5 Sec (Default)/ 7.0 Sec/ 10.5 Sec / 14.0 Sec]

	Timeout Length	This setting sets the time-out length for the 1st dial tone detection. The machine waits for a dial tone for the specified time and disconnects itself from the line when no dial tone is input. [10 Sec (Default)/ 15 Sec/ 20 Sec/ 30 Sec]
BT (Busy Tone) Detection	BT Setting	**DFU** [Off/ On] BT: Busy tone
	BT Frequency	**DFU** [300-550 Hz/ 300-650 Hz/ 325-525 Hz/ 340-550 Hz/ 350-500 Hz/ 350-550 Hz/ 375-475 Hz/ 380-520 Hz]
	BT Level	**DFU** [-35 dB/ -36 dB/ -37 dB/ -38 dB/ -39 dB]
	BT Cadence	**DFU** [0.10/ 0.15/ 0.20/ 0.25/ 0.30/ 0.35/ 0.40/ 0.45/ 0.50/ 0.75]
Comm Settings	RTN Rate	The machine checks the actual data reconstruction errors and then transmits an RTN depending on the decoding error rate that is set by this setting (Number of lines containing an error per page / Total number of lines per page). [10%/ 15%]
	V34 Modem	**DFU** [Permitted (Default)/ Prohibited]
	V17 Modem	**DFU** [Permitted (Default)/ Prohibited]

V34 Settings	Equalizer	These selectors set the equalizer's training level to be applied if training fails due to poor line connection. [Automatic (Default)/ 4 Points/ 16 Points]
	Redialing	Resend when a communication error occurs. [Disabled (Default)/ Not Disabled]
	First TX Speed	Sets the first transmission speed choice, before fallback. [2400 Bps/ 4800 Bps/ 7200 Bps/ 9600 Bps / 12000 Bps/ 14400 Bps/ 16800 Bps/ 19200 Bps/ 21600 Bps/ 24000 Bps/ 26400 Bps/ 28800 Bps/ 31200 Bps/ 33600 Bps (Default)]
	Symbol Rate	This setting limits the transmission speed range in V.34 mode by masking the desired symbol rate(s). [Not Used (Default)/ 3429 Sym/Sec / 3200 Sym/Sec/ 3000 Sym/Sec / 2800 Sym/Sec/ 2400 Sym/Sec]

Reseller Default	
Not Execute	Does not reset anything. Returns to the upper level.
Execute	Resets all the settings to the factory defaults except the following. ▪ Counter for Machine Life After executing, the initial setup menu starts after the next power-on.

Note

- The "Reseller Default" menu can be entered directly at power-on. If you want to enter this mode directly, try the following procedure.
  - Turn on the machine while pressing the "Copy" key.

5.3.3 FAX SERVICE TEST MENU

Entering the Fax Service Test Menu

Turn on the machine while pressing the "Fax" key.

Selecting an Item

To select the item, press the "Up" or "Down" key.

Going into the Next Level/ Returning to the Previous Level

- To go into the next level of an item, select an item then press the "OK" key.
- To return to the previous level of an item, press the "Return" key.

Exiting the Maintenance Mode Menu

To exit the maintenance mode menu, press the "Clear/Stop" or "Return" key until the "Ready" display appears.

Menu List

Fax Test (G181 does not support this menu.)		
Off-Hook Test	On Hook	Executes the on hook test.
	Off Hook	Executes the off hook test
CED Test		Executes the CED test.
CNG Test	1100 Hz	Executes the CNG test
ANSam		Executes the ANSam test.
Ring Tone Test		Executes the ring tone test.
DTMF Test	Tone [0] to [9]	Executes the DTMF tone 0 to 9 test.
	Tone [*]	Executes the DTMF tone * test.
	Tone [#]	Executes the DTMF tone # test.
	Tone Stop	Executes the Stop DTMF tone test.

Modem Test	[V34] 33600 bps	Generates the [V34] 33600 bps signal.
	[V34] 28800 bps	Generates the [V34] 28800 bps signal.
	[V17] 14400 bps	Generates the [V17] 14400 bps signal.
	[V17] 12000 bps	Generates the [V17] 12000 bps signal.
	[V17] 9600 bps	Generates the [V17] 9600 bps signal.
	[V17] 7200 bps	Generates the [V17] 7200 bps signal.
	[V29] 9600 bps	Generates the [V29] 9600 bps signal.
	[V29] 7200 bps	Generates the [V29] 7200 bps signal.
	[V27] 4800 bps	Generates the [V27] 4800 bps signal.
	[V27] 2400 bps	Generates the [V27] 2400 bps signal.
	[V21] 300 bps	Generates the [V21] 300 bps signal.
	Signal Stop	Generates the Stop signal.

5.4 FIRMWARE UPDATING

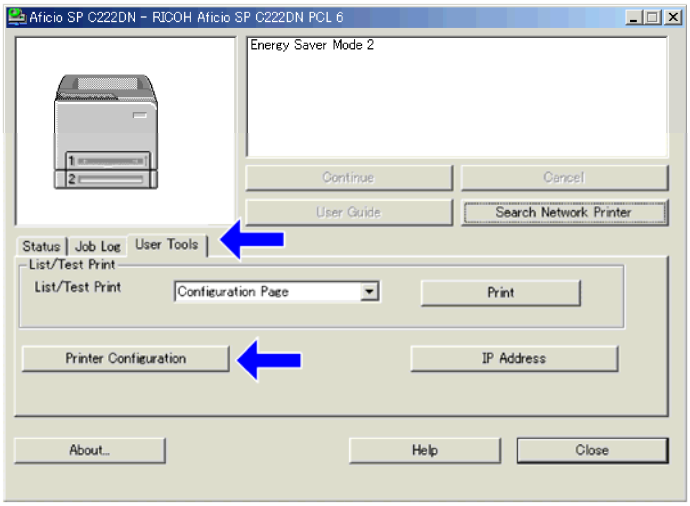
⚠CAUTION

- Do not turn off the main power of the machine during the firmware updating. If doing so, the engine board or controller board may be damaged.

5.4.1 PRINTER MODEL

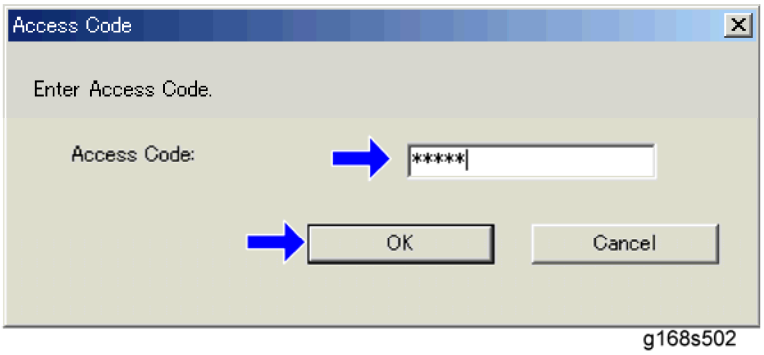
Controller Firmware

1. Start SOM.



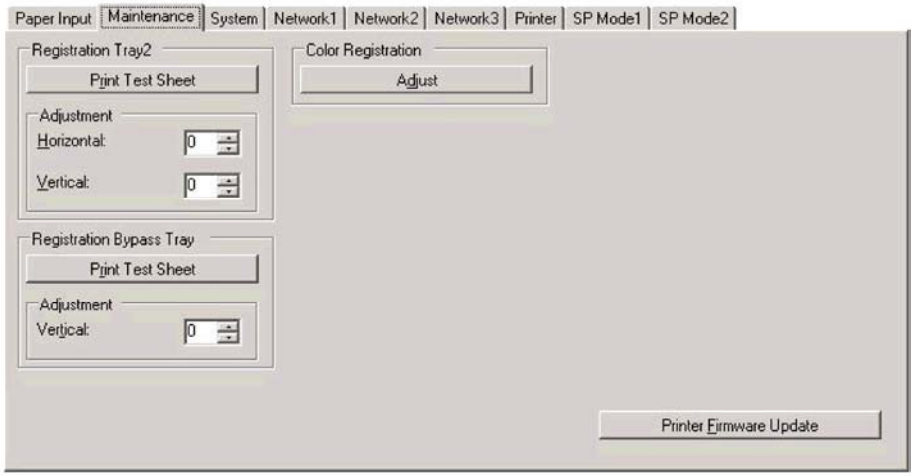
g168s501

2. Click the "Printer Configuration" button on the "User Tools" tab.



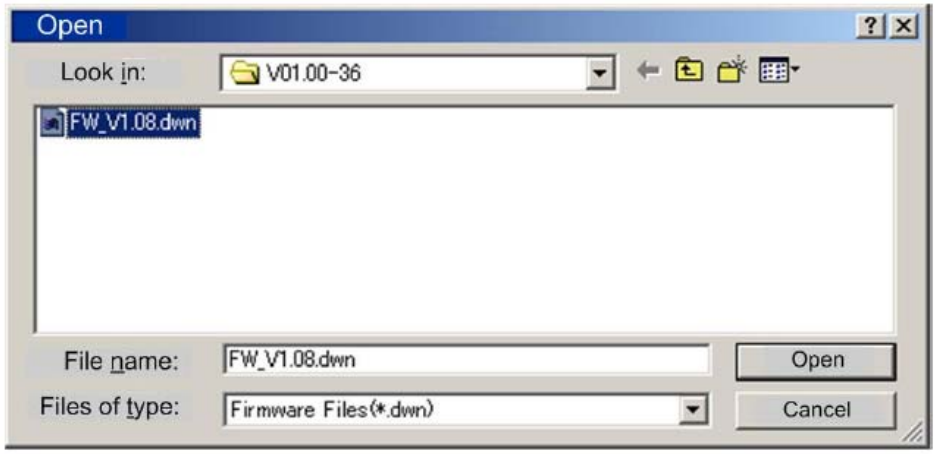
g168s502

3. Input "Admin074" and click the "OK" button.



g165s504

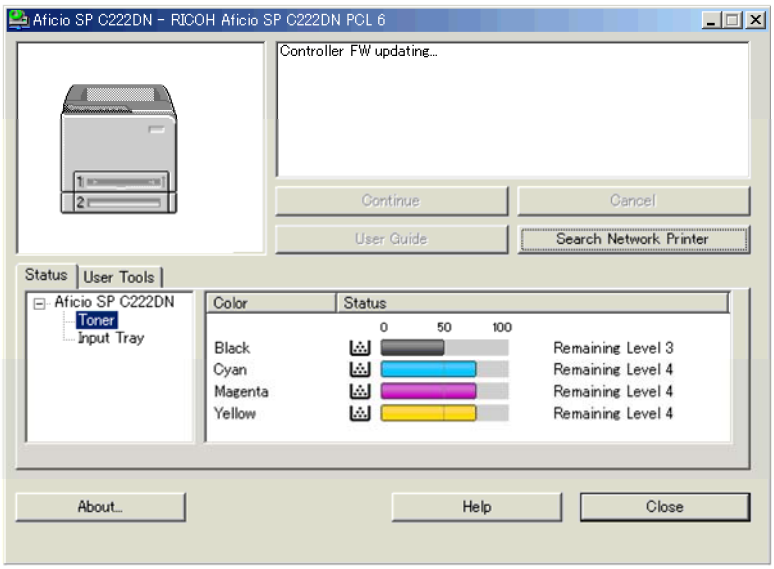
4. Click the "Printer Firmware Update" button on the "Maintenance" tab.



g165s512

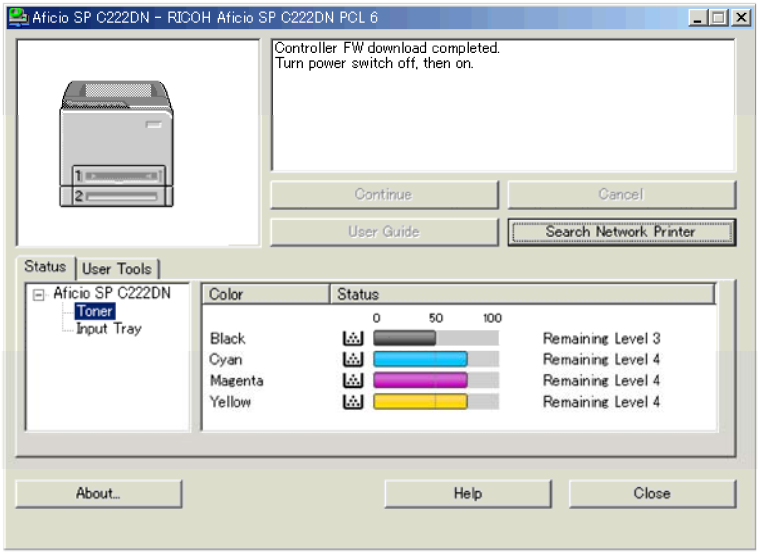
5. Seek the location of the update file and select it, and then click the "Open" button.

Firmware Updating



g165s513

6. SDC shows "Controller FW updating..." and the Alert LED (red) on the printer starts blinking. (The Ready LED remains lit.)
7. Wait for a few minutes.



g165s514

8. When the update has finished, SDC shows "Controller FW download completed." and the Ready LED (green) on the printer starts blinking. (The Alert LED is still blinking.)

Note

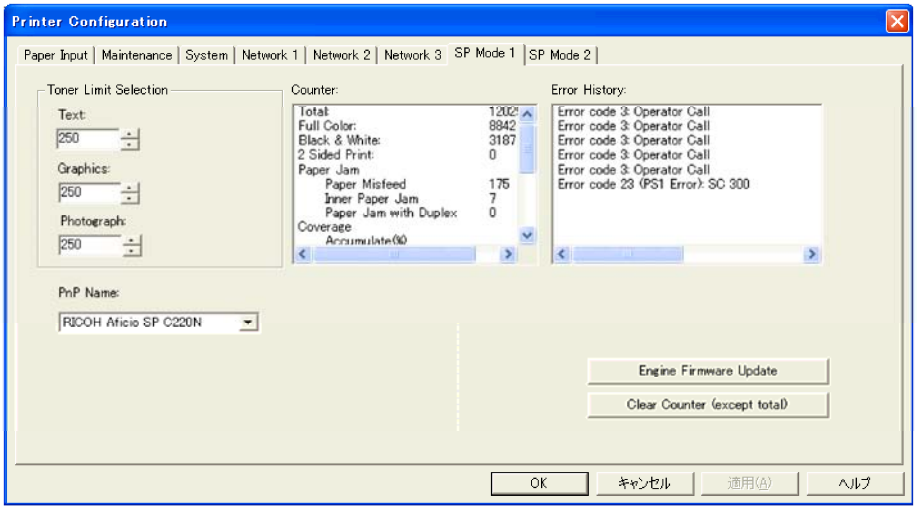
- If "Controller FW download completed" does not appear, the download failed. Try again. You can also switch from an Ethernet connection to a USB connection and see if that works. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.

- If power failed during the download, try again. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.

9. Turn the printer off and on.

Engine Firmware

1. Start SOM.
2. Click the "Printer Configuration" button on the "User Tools" tab.
3. Input " Admin074" and click the "OK" button.



g165s510

4. Click the "Engine Firmware Update" button in the "SP Mode 1" tab.
5. Seek the location of the update file and select it, and then click the "Open" button.
6. SDC shows "Engine FW updating..." and the Alert LED (red) on the printer starts blinking. (The Ready LED remains lit.)
7. Wait for a few minutes.
8. When the update has finished, SDC shows "Engine FW download completed." and the Ready LED (green) on the printer starts blinking. (The Alert LED is still blinking.)

Note

- If "Engine FW download completed" does not appear, the download failed. Try again. You can also switch from an Ethernet connection to a USB connection and see if that works. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.
- If power failed during the download, try again. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.

9. Turn the printer off and on.

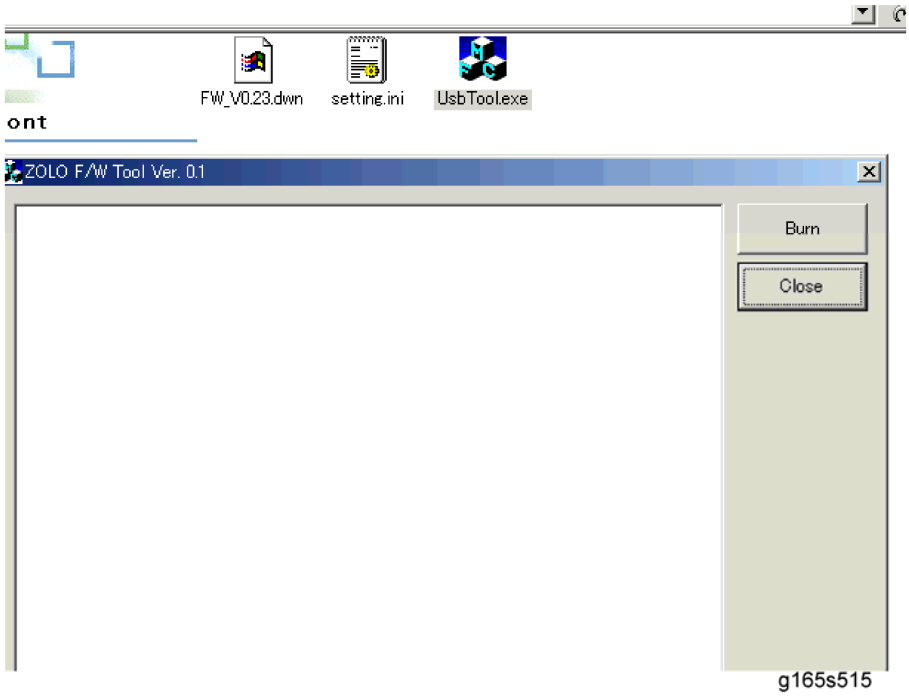
5.4.2 MF MODEL

Checking the Machine Firmware Version

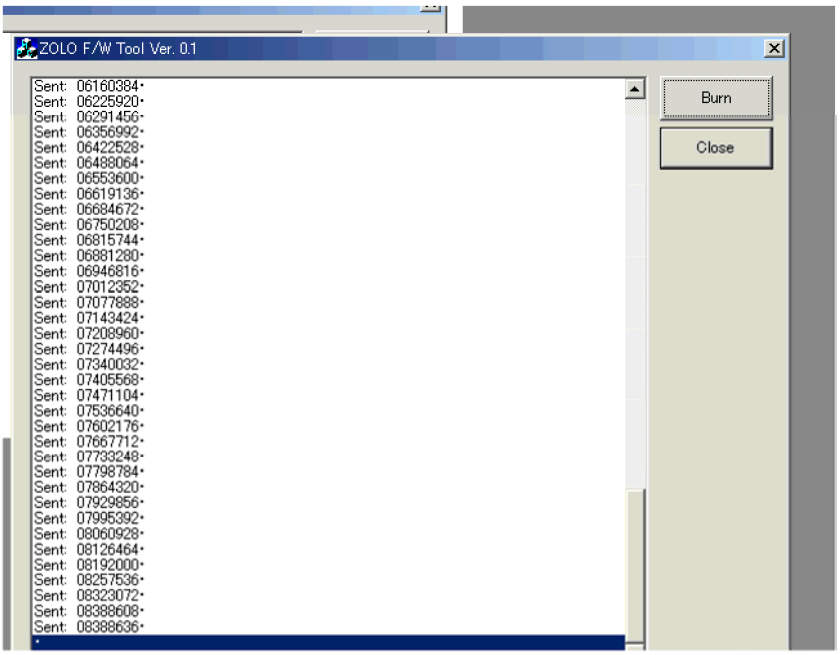
1. Turn the machine on.
2. If the printer driver is not installed on your PC, install the printer driver now.
3. Press "Menu" and select "Report Print" with the "Up" or "Down" key.
4. Press "OK" and select "Maintenance Page" with the "Up" or "Down" key.
5. Press "OK" to display the "Firmware version (Controller)" and "Engine FW version"

Updating the Controller Firmware

1. Make a folder in your computer.
2. Save the files (."dwn", "/ini" and ."exe") in the folder.
3. Click the exe file to execute the updating program.



4. Click "Burn" to send the controller firmware from the PC to the machine.



g165s516

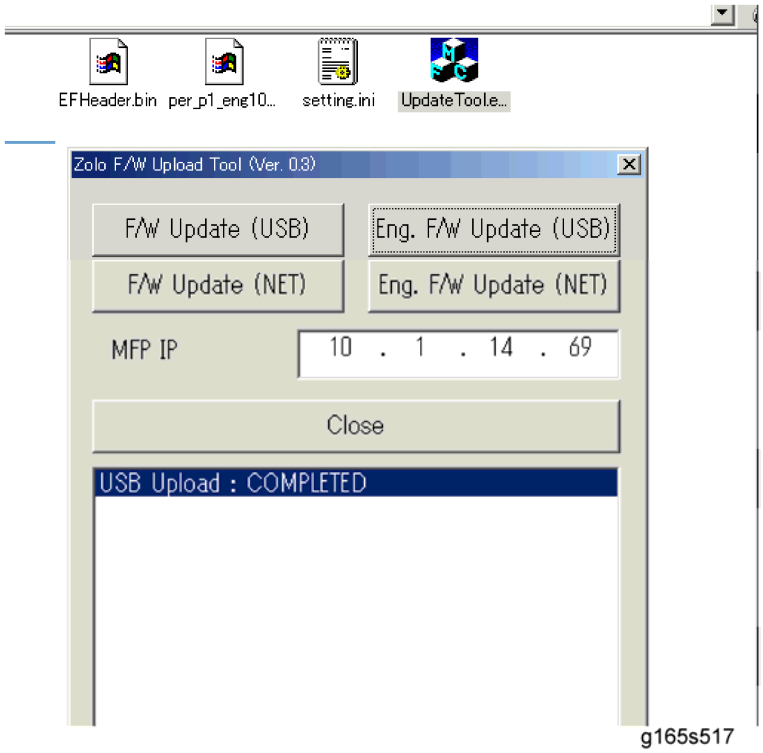
5. The machine makes a beep sound when starting the firmware update.
6. The image above is displayed on the PC and "Firmware update" and "Updating" are displayed on the operation panel.
7. Then, you can close this window at your PC.

⚠CAUTION

- Do not turn off the machine until "Done Please reboot" is displayed in the operation panel. Otherwise, the controller board will be damaged.
- If “Done Please reboot“ does not appear, the download failed. Try again. You can also switch from an Ethernet connection to a USB connection and see if that works. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.
- If power failed during the download, try again. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.

Updating the Engine Firmware

1. Make a folder in your computer.
2. Save the files (."bin", ."fwu", ."ini" and ."exe") in the folder.



g165s517

3. Click the exe file to execute the updating program.
4. Click "Eng. F/W Update (USB or NET)" to send the engine firmware from PC to MF printer.
   - The "F/W Update (USB or NET)" buttons are for designer use only. Do not use these buttons.
5. The machine makes a beep sound when starting the firmware update.
6. The image above is displayed at the PC and "Firmware update" and "Updating" are displayed on the operation panel.
7. Then, you can close this window at your PC.

⚠CAUTION

- Do not turn off the machine until "Done Please reboot" is displayed in the operation panel. Otherwise, the controller board will be damaged.
- If "Done Please reboot" does not appear, the download failed. Try again. You can also switch from an Ethernet connection to a USB connection and see if that works. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.

- If power failed during the download, try again. If you still cannot download the firmware, it may be necessary to change the EGB and/or the controller board.

5.4.3 BOOT LOADER FIRMWARE

This is also listed on the configuration page, but this firmware is not updated in the field.

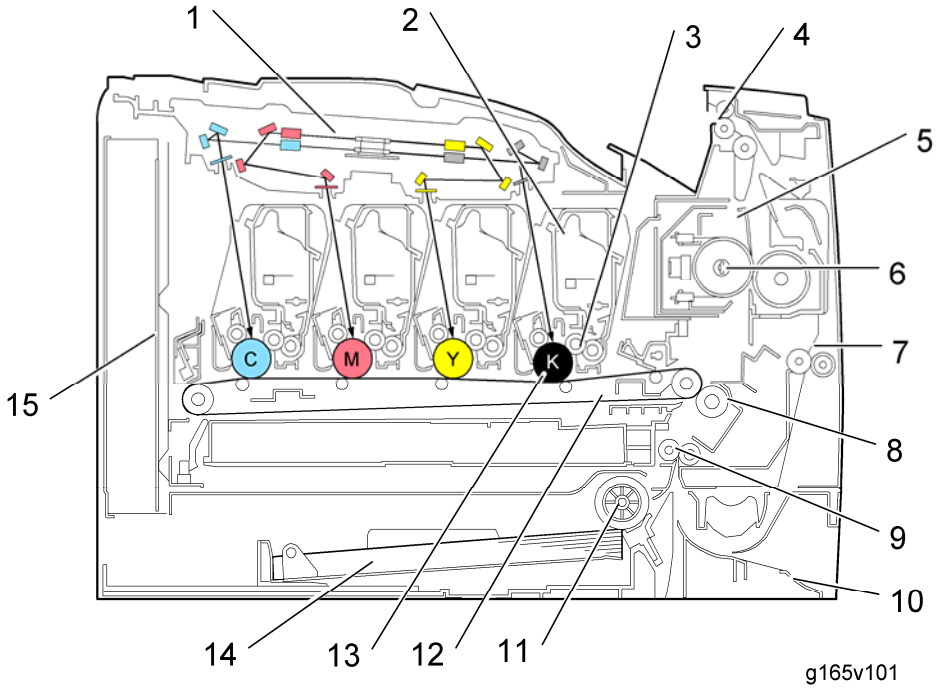
DETAILED DESCRIPTIONS SECTION

6. DETAILED DESCRIPTIONS SECTION

6.1 MACHINE OVERVIEW

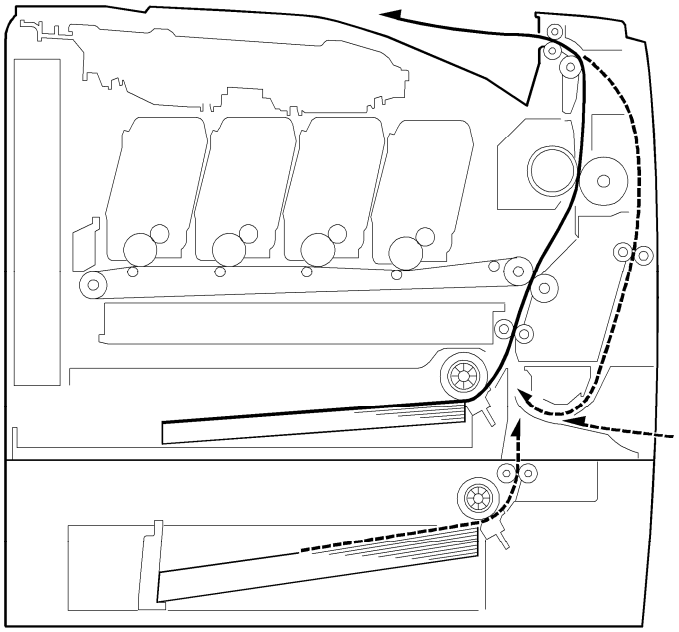
6.1.1 COMPONENT LAYOUT

Engine



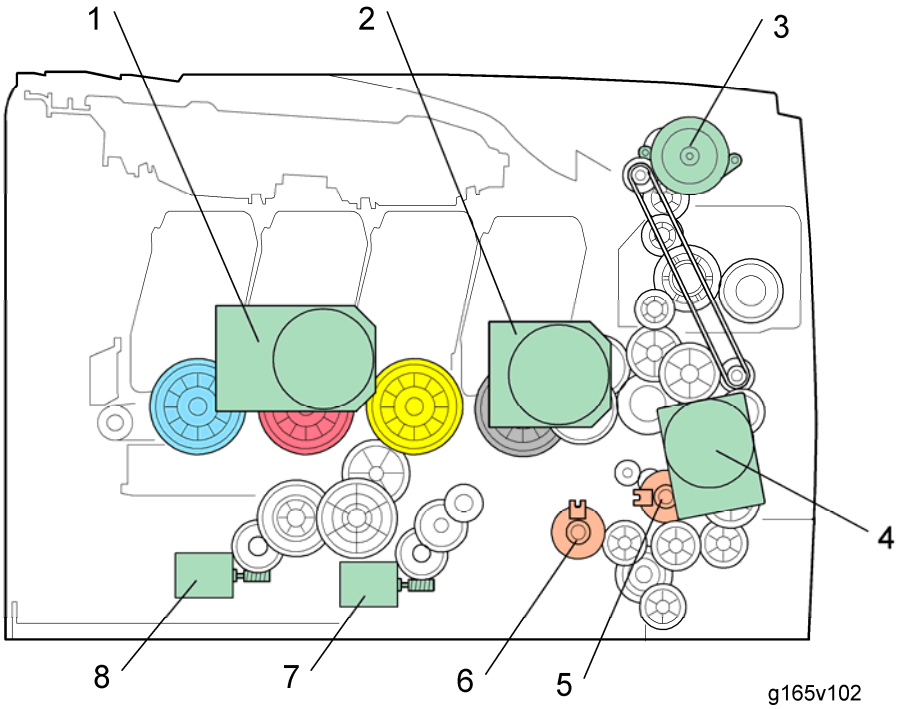
1. Laser Optics Housing Unit 2. Print Cartridge (AIO) 3. Development Roller (AIO) 4. Paper Exit 5. Fusing Unit 6. Fusing Lamp 7. Duplex Path 8. Transfer Roller	9. Registration Roller 10. By-pass 11. Paper Feed Roller 12. ITB (Image Transfer Belt) Unit 13. OPC (AIO) 14. Tray 1 15 EGB/Controller

6.1.2 PAPER PATH



g165v107

6.1.3 DRIVE LAYOUT



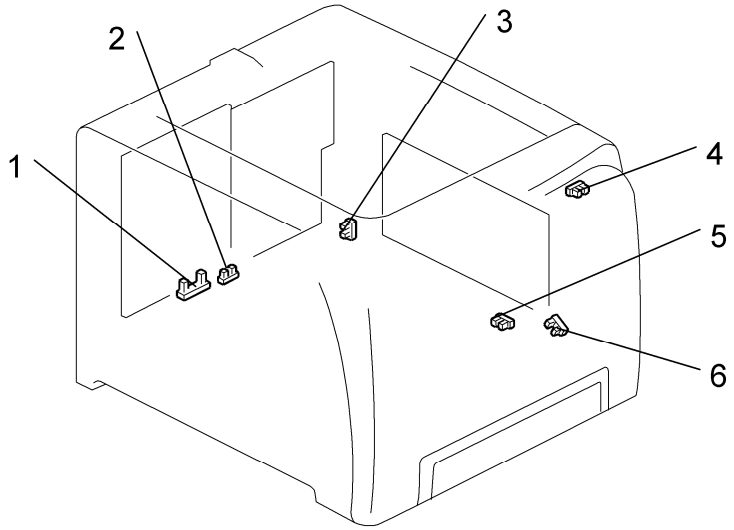
1. Color AIO Motor	5. Registration Clutch
2. Black AIO Motor	6. Paper Feed Clutch
3. Duplex Motor (Duplex model only)	7. Agitator Motor
4. Transport/Fusing Motor	8. ITB (Image Transfer Belt) Contact Motor

- **Color AIO Motor:**
  This drives the color AIOs (Cyan, Magenta and Yellow)
- **Black AIO Motor:**
  This drives the black AIO and the ITB (Image Transfer Belt).
- **Duplex Motor (Duplex model only):**
  This drives the paper exit roller and the duplex roller.
- **Transport/Fusing Motor:**
  This drives the fusing unit, paper feed roller, registration roller and paper exit roller* via the paper feed clutch, registration clutch and gears. (*: This motor only drives the paper exit roller in non-duplex models.)
- **Registration Clutch:**
  This transfers drive from the transport/ fusing motor to the registration roller.

- **Paper Feed Clutch:**
  This transfers drive from the transport/ fusing motor to the paper feed roller.
- **Agitator Motor:**
  This moves the agitators in the waste toner bottle.
- **ITB Contact Motor:**
  This moves the ITB into contact with and away from the color OPCs.

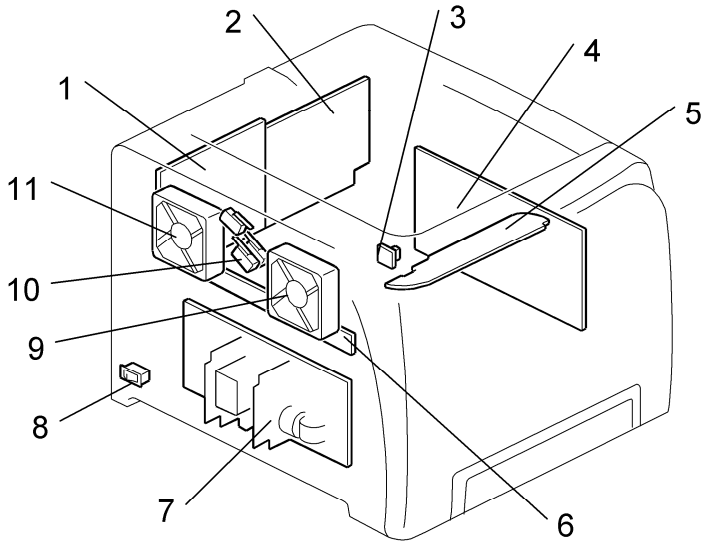
6.1.4 ELECTRICAL COMPONENT LAYOUT

Engine



g165v105

No.	Parts Name	Description
1	Waste Toner Overflow Sensor	This sensor detects whether the waste toner bottle is full.
2	Waste Toner Bottle Set Sensor	This sensor detects whether the waste toner bottle is set.
3	ITB Contact Sensor	This sensor detects whether the image transfer belt is in contact with the color OPCs (C, M, Y).
4	Paper Exit Sensor	This sensor detects a paper jam in the fusing unit, paper exit path and duplex path.
5	Paper End Sensor	This sensor detects paper end and whether the tray is set.
6	Registration Sensor	This sensor detects a paper jam at the paper feed, by-pass feed and registration roller, and also determines the paper size based on the sensor on-off time.



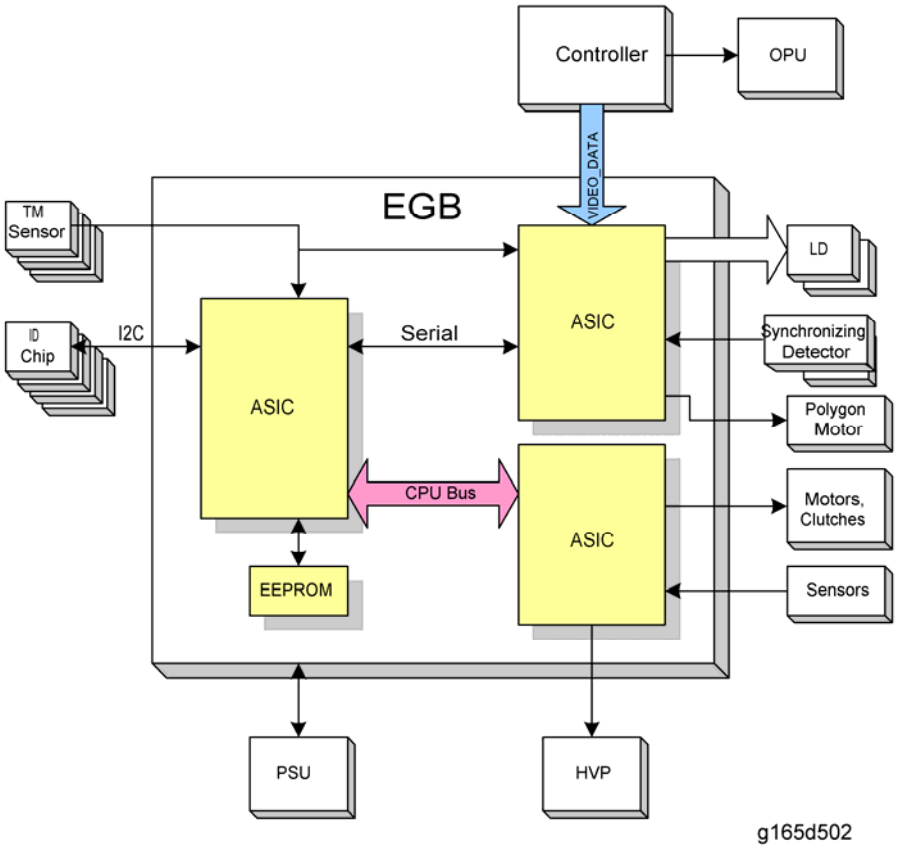
g165v103

No.	Parts Name	Description
1	EGB (Engine Board)	This board controls all of the machine, input/output, drivers and input/output connections and the handshake with the Controller.
2	Controller Board (printer model)	This board controls the memory, all applications and all peripheral devices.
3	Temperature/Humidity Sensor	This sensor detects the relative temperature and humidity around the machine.
4	High Voltage Power Supply Board	This board supplies the charge to the image transfer roller and high voltage for the charge roller, transfer roller and the development roller.
5	Operation Panel Board	This board controls the operation of the operation panel keys and LEDs.
6	ID Chip Board	This board relays the ID chip data of each AIO from/to the EGB.

7	PSU (Power Supply Unit)	This supplies DC power for the EGB, fusing unit and interlock switches.
8	Main Switch	This switch provides power to the machine.
9	Fusing Fan Motor	This motor exhausts air around the fusing unit.
10	Interlock Switches	These switches turn off DC power when the front cover or top cover is open.
11	LSU Fan Motor	This motor exhausts air around the laser optics housing unit.

6.1.5 BOARD STRUCTURE

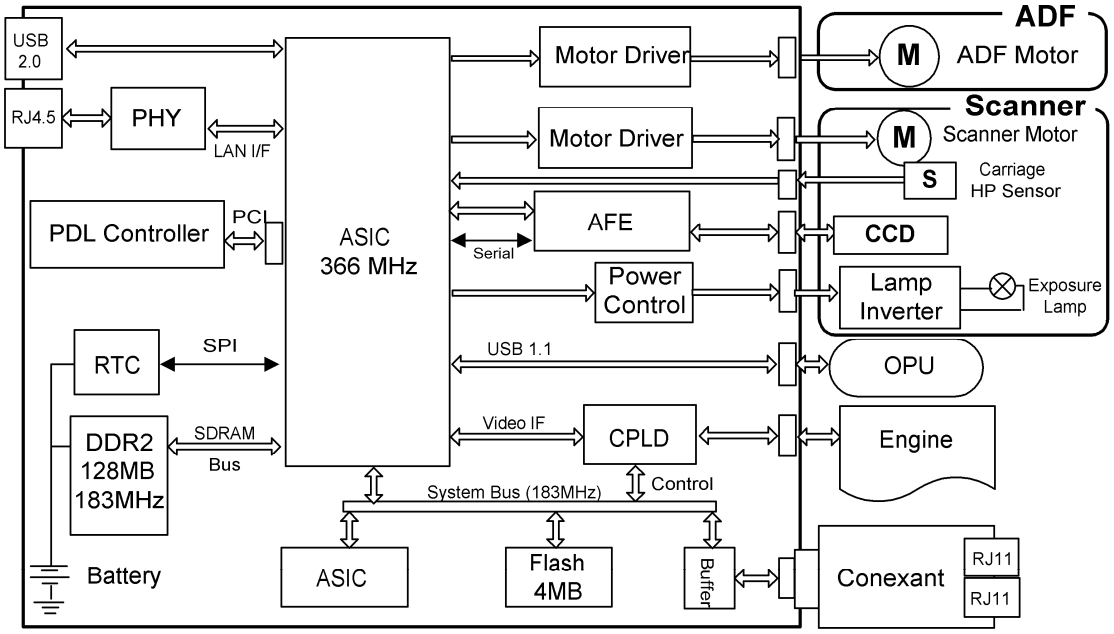
Printer Model



Descriptions

- EGB (Engine Board):
  This controls the Engine, the controller interface, image processing, MUSIC (Mirror Unit for Skew and Interval Correction), input/output, interfaces with the optional units, and the operation panel. MUSIC is also called Automatic Line Position Adjustment).
- Controller:
  This controls the interface between the OPU and EGB, and applications. The controller connects to the EGB through the PCI Bus (Peripheral Component Interconnect Bus).
- LD Drive Board:
  This is the laser diode drive circuit board.
- Memory DIMM (Standard: 64MB (P1a)/ 128MB (P1b/c), Option: 256MB):
  This is for more printer processing memory, and is also used for collation and for soft fonts.
- OPU (Operation Panel Unit):
  This controls the display panel, the LED, and the keypad.

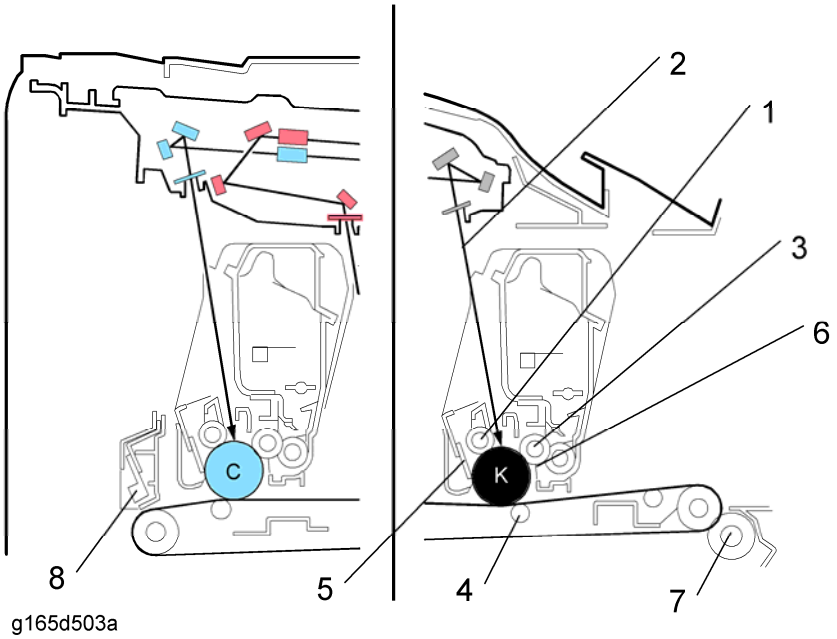
MF Model



g165d503

- EGB (Engine Board):
  This controls the Engine, the controller interface, image processing, MUSIC (Mirror Unit for Skew and Interval Correction), input/output, interfaces with the optional units, and the operation panel. MUSIC is also called Automatic Line Position Adjustment).
- Controller:
  This controls the interface between the OPU and EGB, ADF, Scanner unit and applications. The controller connects to the EGB through the PCI Bus (Peripheral Component Interconnect Bus).
- LD Drive Board:
  This is the laser diode drive circuit board.
- Memory DIMM (Standard: 128MB (MF1a/b), 256MB (MF1c), Option: 256MB):
  This is for more printer processing memory, and is also used for collation and for soft fonts.
- OPU (Operation Panel Unit):
  This controls the display panel, the LED, and the keypad.

6.1.6 PRINTING PROCESS



g165d503a

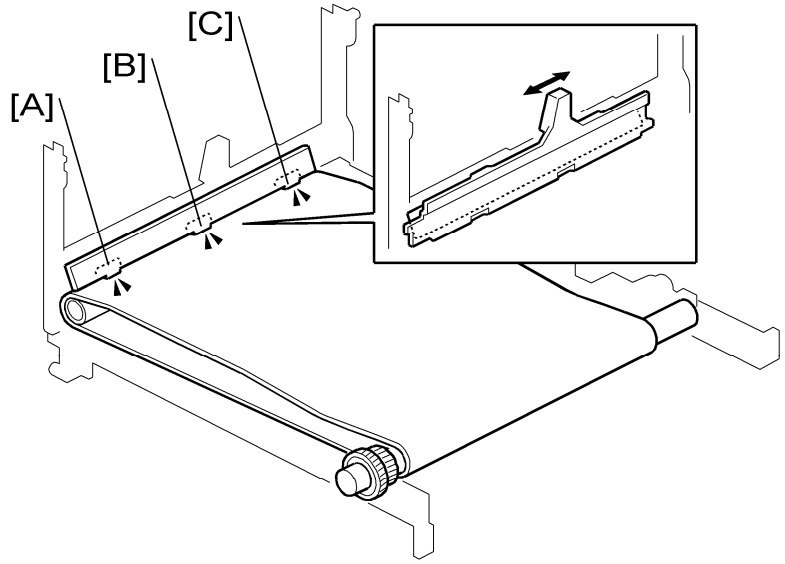
This machine uses four AIOs and four laser beams for color printing. Each AIO contains a drum, charge roller, cleaning brush, blade, development roller and mixing auger.
The toner image on each drum is moved to the image transfer belt. The four colors are put on the belt. All four toners are put on the belt at the same time. Then the completed four-color image is moved to the paper.

1. OPC charge (AIO):
   The charge roller gives the OPC a negative charge.
2. Laser exposure:
   The laser beam from the laser diode (LD) goes through the lens and mirrors and to the drum. To make a latent image on the drum, the machine turns the laser beam on and off.
3. Development (AIO):
   The development roller moves negatively-charged toner to the latent image on the drum surface. This machine uses four development units (one for each color).
4. Image transfer:
   The charge that is applied to the image transfer roller pulls the toner from the drum to the transfer belt. Four toner images are put on the paper at the same time.
5. Cleaning for the OPC:
   The cleaning blade removes remaining toner on the drum surface after image transfer to the paper.

6. Quenching for the Development Roller:
   Charge is removed from the development roller with a quenching sheet in the AIO. There is no quenching for the OPC drum.
7. Paper Transfer and Separation:
   Toner transfers from the image transfer belt to the paper when the paper is fed between the image transfer belt and transfer roller. After transfer, the paper separates from the image transfer belt, because of a discharge plate immediately after the transfer roller.
8. TM (Toner Mark) sensor:
   The TM sensor board contains three TM sensors (one at the left, one at the center, and one at the right). The center TM sensor detects the density of the sensor patterns on the transfer belt. The TM sensor output is used for process control and for automatic line-position adjustment, skew, and color registration adjustments for the latent image.

6.2 PROCESS CONTROL

6.2.1 OVERVIEW



g165d305

This machine has these two forms of process control:

- Potential control
- Toner supply control

Process control uses these components:

- Three TM (Toner Mark) sensors (left [A], center [B], and right [C]). Only the center TM sensor (direct-reflection and diffusion type) is used for process control. The left and right TM sensors (direct-reflection type) are used for line positioning and other adjustments.
- Temperature/humidity sensor at the rear right of the machine.

6.2.2 PROCESS CONTROL FLOW

1. TM sensor correction (Vsg adjustment)
   The center TM sensor checks the bare transfer belt's reflectivity and the machine calibrates the TM sensors.
2. Development bias control
   The machine makes a 7-gradation pattern on the transfer belt for each toner color. The pattern has 9 squares (the sequence is as follows: 7 yellow squares, 7 cyan squares, 7 magenta squares and 7 black squares). Each of the squares is 10 mm x 17 mm, and is a solid-color square. To make the squares, the machine changes the development bias and charge roller voltage. The difference between development bias and charge roller voltage is always the same.
   The center TM sensor detects the densities of the 7 solid-color squares for each color. The machine calculates an appropriate development bias from this data.
   This control takes about 33 seconds to be completed.
3. LD power control
   For LD power control, the machine does the same sequence described in "2 Development bias control." Finally, the machine calculates an appropriate LD power.
4. MUSIC (Mirror Unit Skew and Interval Control)
   The machine uses the TM sensors to measure sample lines deposited on the ITB, and corrects color image registration adjustment based on the sensor readings. Sample lines are made on the left, center and right of the ITB.
   This control takes about 22 seconds to be completed.

6.2.3 PROCESS CONTROL SELF-CHECK

This machine does potential control with a procedure that is known as the process control self-check. This procedure is done at these 7 times.

Timing	Execution Mode
1. Initial Power-ON	▪ Development Bias Control and MUSIC (approx. 55 seconds) ▪ MUSIC only (approx. 22 seconds) ▪ No Execution One of the control modes is executed at each timing. What control mode is done depend(s) on some conditions as described in the text that follows this table.
2. Recovery form Sleep Mode	
3. Front or Top Cover Open/Close	
4. Ready Status	
5. Before Job	
6. Page End	
7. Job End	

1. Initial
   - Toner amount control and MUSIC start automatically immediately after the power is turned on, if one of the following conditions occurs.
     1) New AIO detection
     2) New ITB (Image Transfer Belt) unit detection (after transfer unit life counter is reset with SP mode)
     3) Environment (temperature and humidity) change detection.
   - MUSIC starts automatically immediately after the power is turned on (there is toner amount control) if conditions other than described above occur.
2. Recovery from Sleep Mode
   - Toner amount control and MUSIC start automatically when the machine comes back from energy saver mode, if one of the following conditions occurs.
     1) New AIO detection
     2) New ITB (Image Transfer Belt) unit detection (after transfer unit life counter is reset with SP mode)
     3) Environment (temperature and humidity) change detection.
   - MUSIC starts automatically (there is toner amount control) when the machine comes back from energy saver mode, if the following condition occurs.

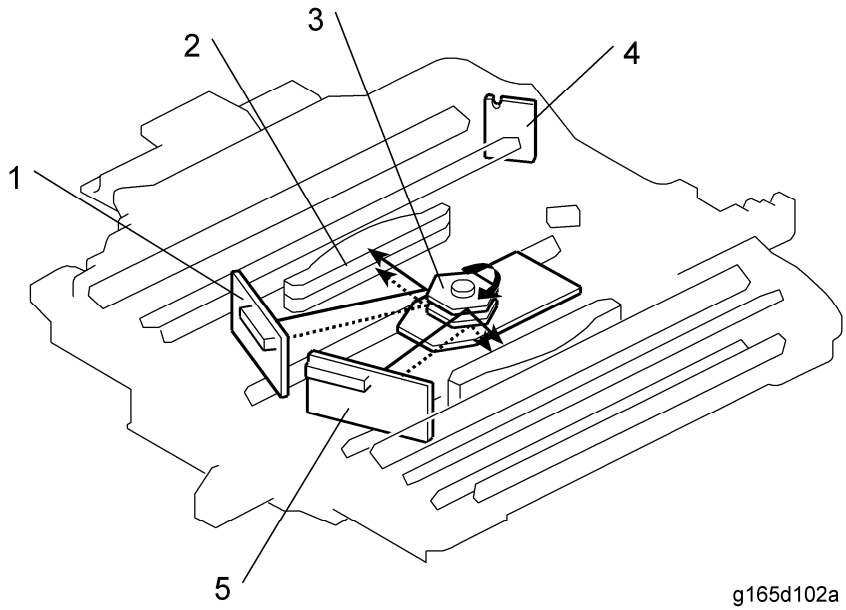
1) The previous MUSIC was done if there was a high temperature inside the machine.

3. Immediately after the front or top cover is closed
   - No adjustment is done when the front or top cover is closed, if one of the following conditions occurs.
     1) After paper jam detection and New AIO detection
     2) New ITB unit detection (after transfer unit life counter is reset with SP mode)
     3) No environment change
   - Toner amount control and MUSIC start automatically when the front or top cover is closed, if conditions other than described above occur.
4. Ready status:
   - Toner amount control and MUSIC start automatically when the machine stays in the ready condition and the environment has changed.
5. Before a job:
   - MUSIC starts automatically before a job if the previous MUSIC was done when there was a high temperature inside the machine and a specified time has elapsed.
   - MUSIC starts automatically before a job if the machine is turned on in a low temperature condition and a specified time has elapsed.
6. Page end:
   - Toner amount control and MUSIC start automatically between pages when the machine detects an environment change.
   - Toner amount control and MUSIC start automatically between pages when the machine has copied/printed 200 pages since the previous process control.
   - Toner amount control and MUSIC interrupt a job and start automatically between pages when the machine has copied/printed 250 pages since the previous process control.
   - MUSIC starts automatically between pages when the machine has copied/printed 100 pages in the same job since the previous process control.
   - MUSIC starts automatically between pages when the polygon motor has been rotating for 180 seconds.
   - MUSIC interrupts a job and starts automatically between pages when the polygon motor has been rotating for 300 seconds.

7. Job end:
    - Toner amount control and MUSIC start automatically after a job when the machine gets a request to execute the toner amount control and MUSIC.
    - MUSIC starts automatically after a job when the machine gets a request to execute MUSIC.

6.3 LASER EXPOSURE

6.3.1 OVERVIEW



1. LD unit - C/M 2. Fθ Lens 3. Polygon Mirror Motor	4. Synchronizing Detector Board 5. LD unit - K/Y

This machine uses two LDB units and one polygon mirror motor to produce latent images on four OPC drums (one drum for each color toner).

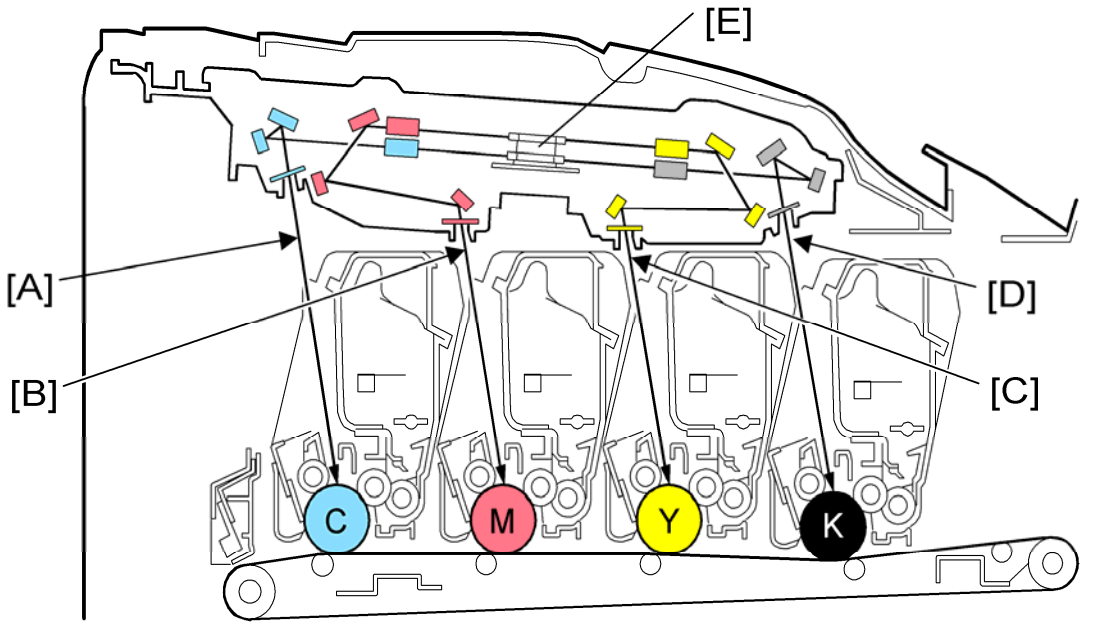
There are two hexagonal mirrors. The polygon mirror motor rotates the mirrors clockwise and each mirror reflects beams from the LD unit.

The laser beam from the LD unit - C/M is directed to the Fθ lens at rear side by the polygon mirrors. The laser beam from the LD unit - K/Y is directed to the Fθ lens at front side by the polygon mirrors.

Laser exposure for magenta and cyan starts from the left side of the drum, but for yellow and black it starts from the right side of the drum. This is because the units for magenta and cyan are on the other side of the polygon mirror from the units for yellow and black.

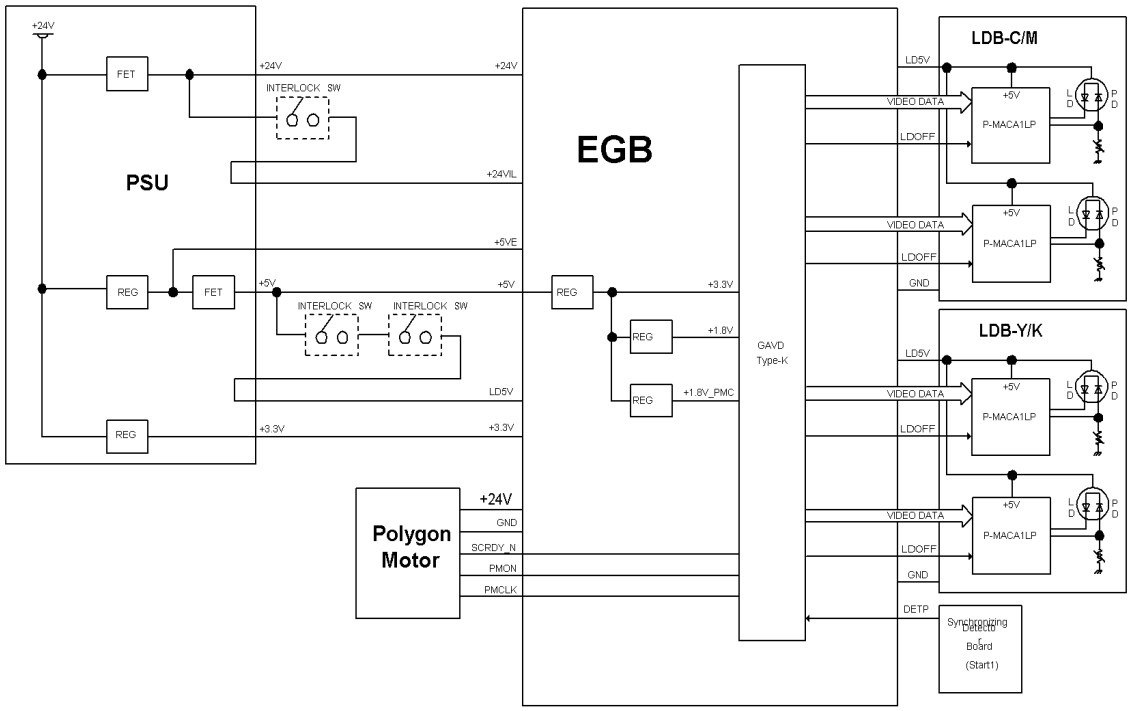
The machine has one laser synchronizing detector board (LSD) as shown above. The board detects four colors. The LSD detects the start of the main scan.

6.3.2 OPTICAL PATH



The laser beams for magenta [B] and yellow [C] are sent to the upper part of the polygon mirror [E]. The laser beams for cyan [A] and black [D] are sent to the lower part of the polygon mirror.

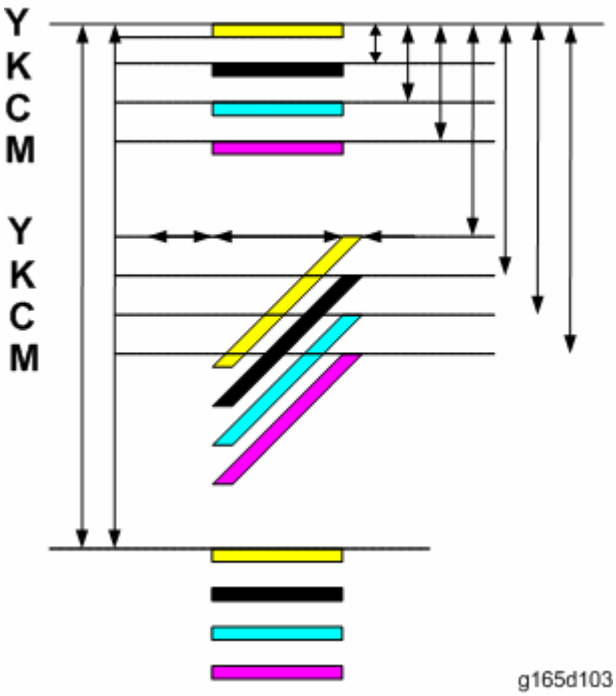
6.3.3 LD SAFETY SWITCH



g165d505

A safety switch turns off when the front cover or the top cover is opened. As a result, the relay on the PSU cuts off the power supply (+5V) to the two LD boards. (The circuits go through the EGB.) This system prevents unexpected laser emission, and ensures user safety and technician safety.

6.3.4 MUSIC (MIRROR UNIT SKEW AND INTERVAL CORRECTION)



During MUSIC, the line patterns above are made 16 times for fine adjustment or 8 times for the rough adjustment on the transfer belt. The spaces between the lines (YY, KK, CC, MM, KY, KC, KM) are measured by the front, center, and rear TM sensors. The controller reads the average of the spaces, and adjusts these items:

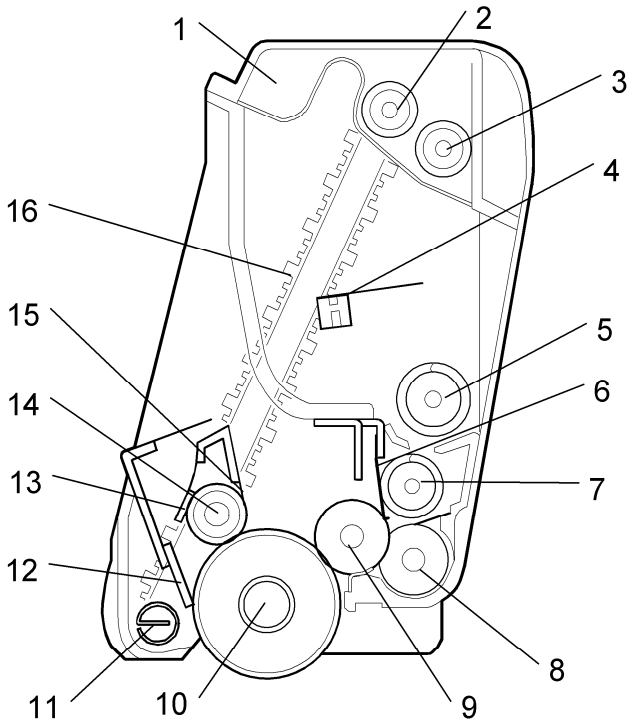
- Sub scan line position for YCM
- Main scan line position for KYCM
- Magnification ratio for KYCM
- Phase control

The transfer-belt-cleaning unit cleans the transfer belt after the patterns are measured.

The execution timing for MUSIC follows the sequence of the process control (☛ "Process Control").

6.4 AIO (ALL IN ONE) CARTRIDGE

6.4.1 OVERVIEW

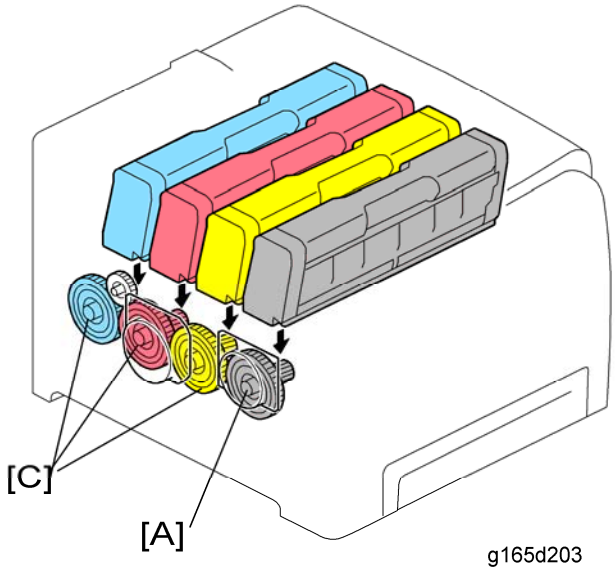


g165d202

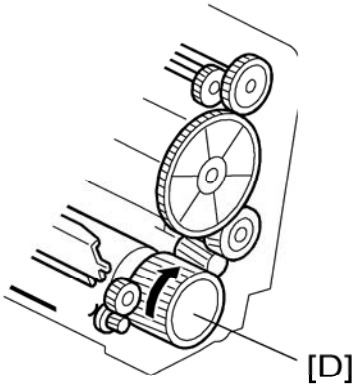
1. Waste Toner Container	9. Development Roller
2. Transport Belt Shaft	10. OPC
3. Waste Toner Collection Coil	11. Waste Toner Collection Coil
4. Toner Agitator	12. OPC Cleaning Blade
5. Upper Mixing Roller	13. Charge Roller Cleaner 2
6. Development Blade	14. Charge Roller
7. Lower Mixing Roller	15. Charge Roller Cleaner 1
8. Toner Supply Roller	16. Waste Toner Transport Belt

This machine uses the AIO system. Each AIO consists of the waste toner tank, print cartridge part, development unit part, and PCU part. This gives the user easy replacement procedures and helps to make the engine module more compact. The waste toner bottle is smaller than other full-color printers because the waste toner from the OPC is collected in the waste toner tank of each AIO. The diameter of the OPC is 24 mm and the diameter of the development roller is 12 mm.

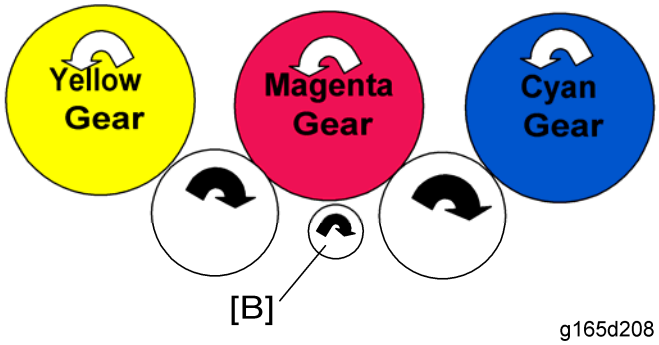
6.4.2 DRIVE



g165d203



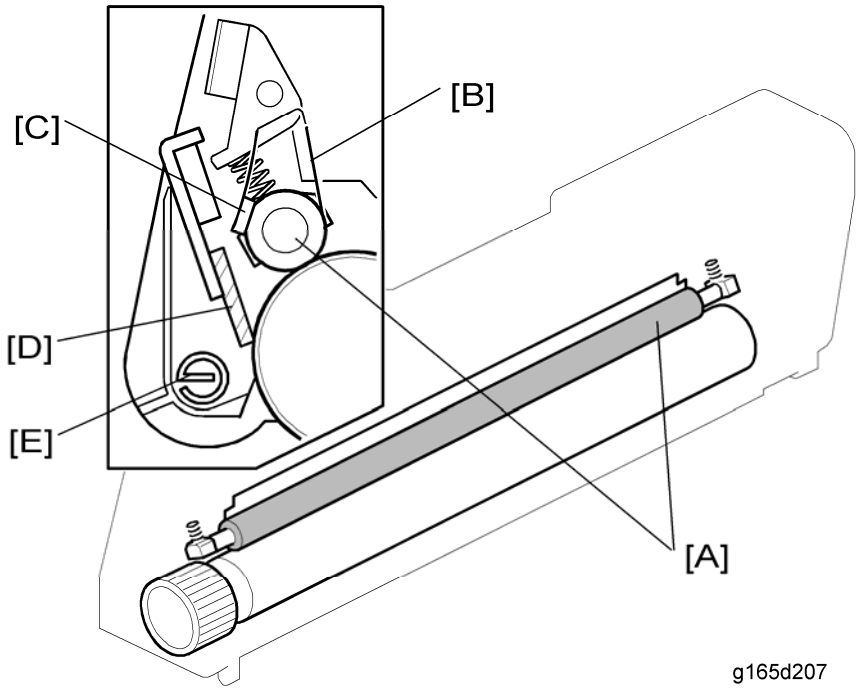
g165d204a



g165d208

The black AIO motor drives the gear [A] for the black AIO. The color AIO motor drives the gears [B] and color gears [C] for the cyan, magenta and yellow AIOs through gears. Each of these gears engages with a gear [D] in the OPC, and this gear drives the rollers in the AIO through other gears.

6.4.3 OPC CHARGE AND CLEANING

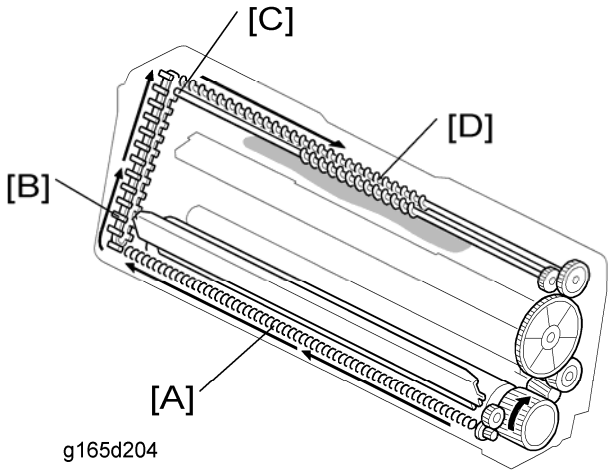


This machine uses a charge roller [A]. The charge roller gives the drum surface a negative charge. The high voltage supply board, which is at the left side of the machine, applies a dc and ac voltage (at a constant current) to the roller. The ac voltage helps to make sure that the charge given to the drum is as constant as possible.

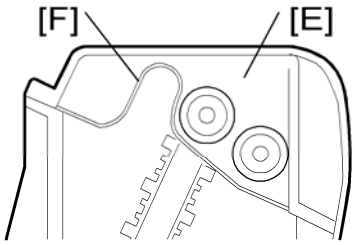
The machine automatically controls the charge roller voltage when process control is done.

The charge roller cleaner 1 [B] and charge roller cleaner 2 [C], which always touch the charge roller, clean the charge roller. The OPC cleaning blade [D] removes the waste toner on the OPC. The toner collection coil [E] moves the toner to the waste toner transport belt.

6.4.4 WASTE TONER COLLECTION FROM THE OPC



g165d204



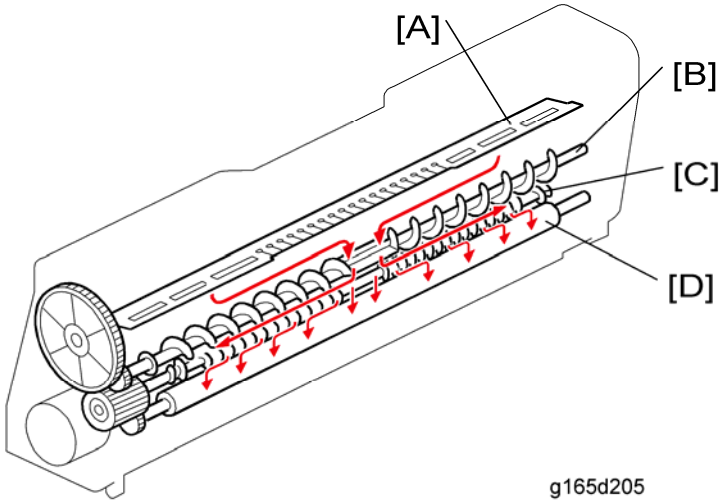
g165d202a

The waste toner collection coil [A] transports waste toner from the OPC to the right side of the AIO. After that, the waste toner transport belt [B], which is driven by the transport belt shaft [C], lifts waste toner up to the waste toner tank [E].

The collected waste toner is moved to the left side of the AIO by the waste toner collection coil [D] and transport belt shaft [C].

A flexible sheet [F] separates the unused toner area from the waste toner area. The waste toner area becomes larger when toner is consumed.

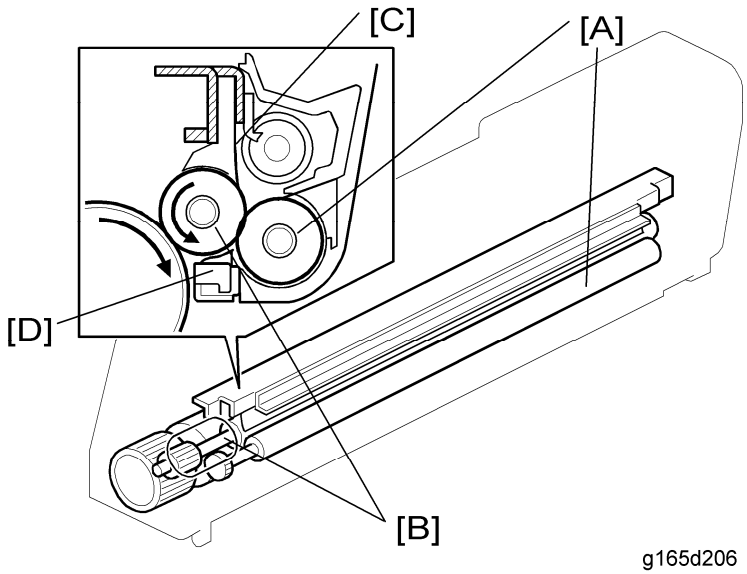
6.4.5 TONER MIXING AND TRANSPORT



g165d205

The toner moves as shown in the above drawing. The toner agitator [A] mixes the toner so that it is transported evenly to the mixing rollers. The upper mixing roller [B] moves toner to the center, then the lower mixing roller [C] moves toner to the right and left sides. Finally, the toner supply roller [D] supplies toner to the development roller. This mixing mechanism prevents toner hardening and uneven image density in the outputs.

6.4.6 DEVELOPMENT MECHANISM



This machine does not use developer, so a TD sensor is not necessary. In each AIO unit, the toner supply roller [A] supplies toner to the development roller [B]. Electrostatic attraction generated by the friction between the toner supply roller and development roller moves toner to the surface of the development roller, and the development blade [C] makes sure that the layer of toner on the development roller has an even thickness.
The discharge sheet [D] removes development roller bias.

6.4.7 TONER NEAR END AND END DETECTION

Toner Near End

To detect the toner near-end, the machine uses:

- Pixel count (memory chip on the AIO)
- AIO rotation distance (memory chip on the AIO)

Toner End

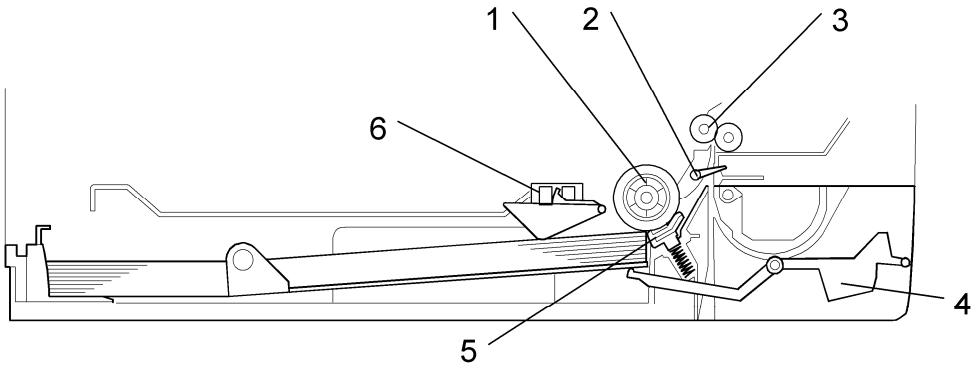
To detect toner end the machine uses:

- Output from the TM sensor (center)

After near-end, it is estimated that 200 pages (A4, 5% coverage) can be printed until toner end occurs.

6.5 PAPER FEED

6.5.1 OVERVIEW

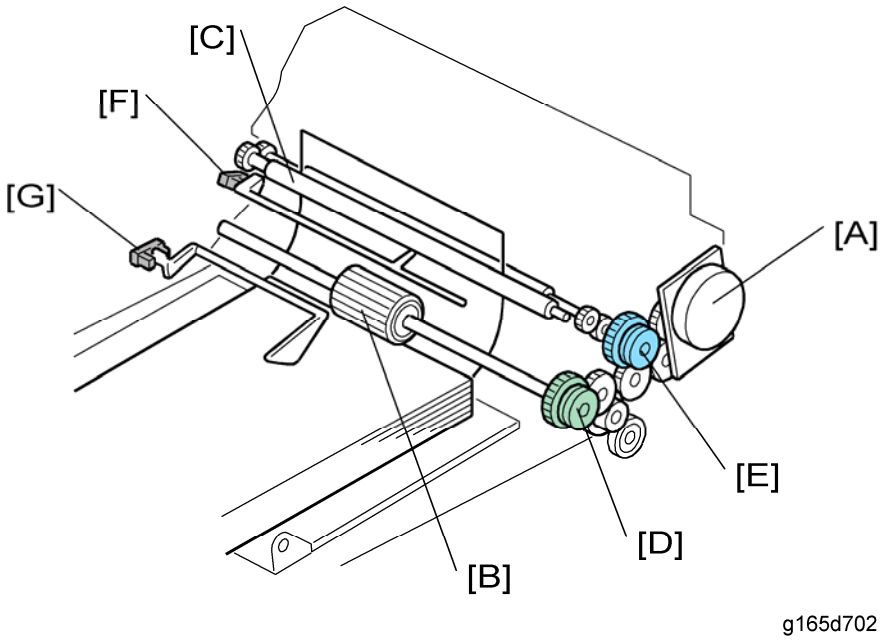


g165d701

1. Paper Feed Roller	4. Paper Height Lever
2. Registration Sensor	5. Separation Pad
3. Registration Roller	6. Paper End Sensor

This machine has a paper tray (250 sheets) and a by-pass paper feed (single sheet).
The paper feed mechanism uses a friction pad system.
The paper end sensor detects whether paper is installed in the tray and whether the tray is set in the machine, because this machine does not have a tray set sensor.
This machine also does not have automatic paper size detection. The machine determines the paper size from the on-off timing of the registration sensor. If the paper type which is selected at the PC does not match the paper size measured by the registration sensor, the machine issues a paper jam alert and stops the motors.

6.5.2 DRIVE AND PAPER END DETECTION



Paper Feed

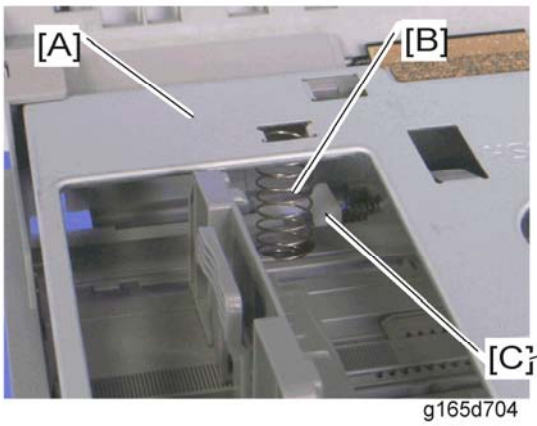
The transport/fusing motor [A] controls the paper feed roller [B] and registration roller [C] with the paper feed clutch [D], registration clutch [E] and gears. (The transport/fusing motor also controls the fusing unit and paper exit roller.) The paper feed roller feeds a sheet of paper to the registration roller [C].

When the registration sensor [F] detects a sheet of paper, the machine makes a paper buckle at the registration roller to correct paper skew. After that, the registration clutch turns on, and then the registration roller transports a sheet of paper to the transfer roller unit.

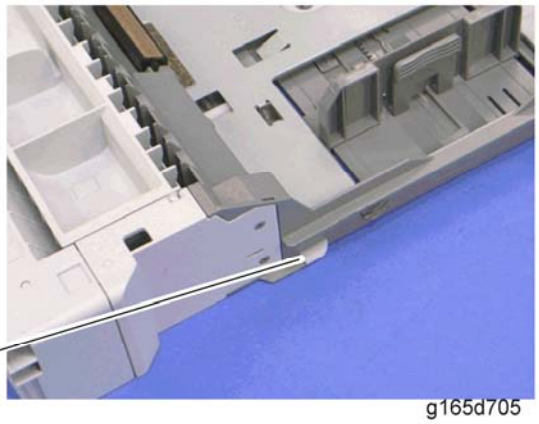
Paper End Detection

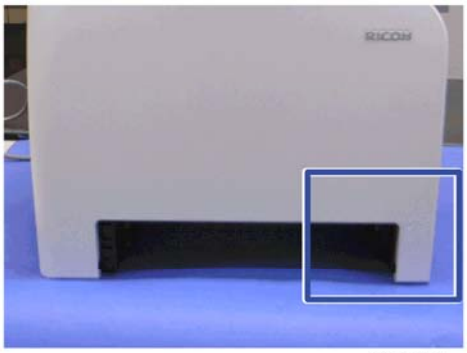
There is a paper end sensor [G] in the tray. The feeler drops into the cutout in the bottom plate and the actuator interrupts the paper end sensor. This sensor also detects whether the tray is set.

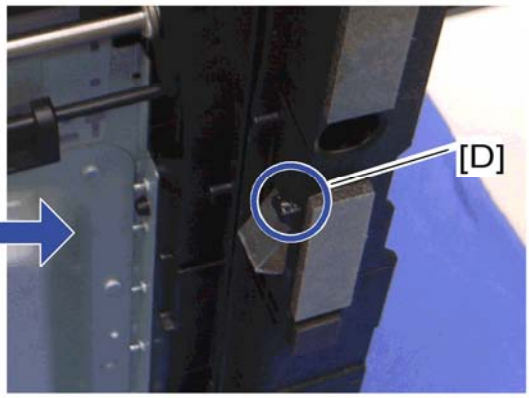
6.5.3 TRAY LIFT



g165d704


g165d705

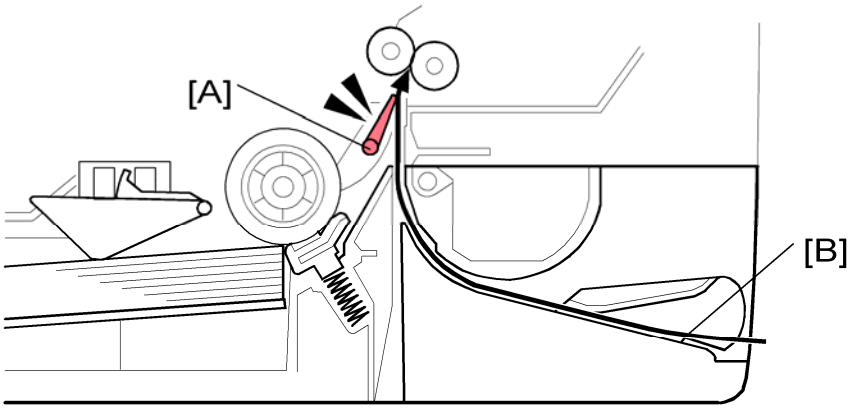

g165d707



g165d706

The bottom plate [A] is lifted by the springs [B] in the tray when the tray is inserted in the machine, and the bottom tray lock lever [C] is released by the projection [D] at the right side of the tray set location. There is no tray lowering mechanism for these models. Therefore, you must press the bottom plate down when you insert the tray in the machine.

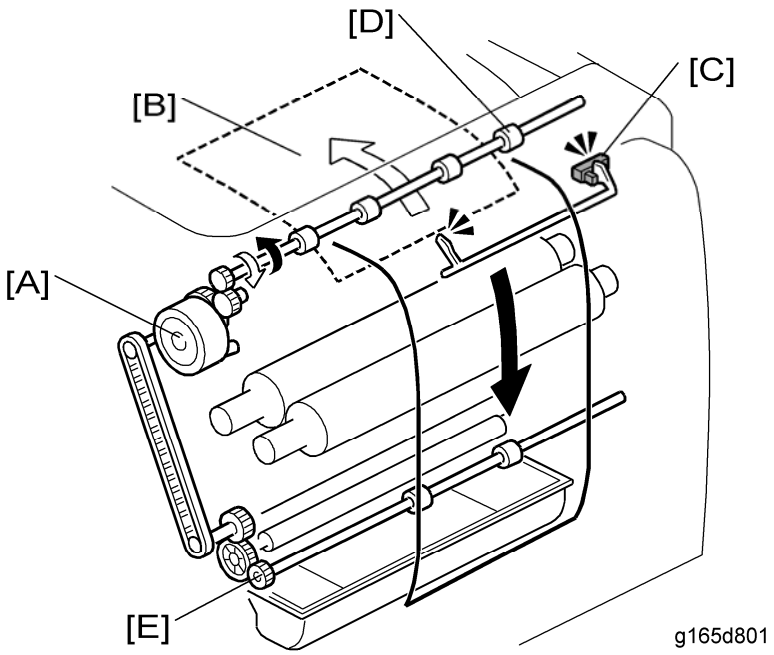
6.5.4 BY-PASS FEED



This machine uses a manual by-pass feed system. When the registration sensor [A] detects a sheet of paper [B] but no job has come in from a PC, the machine determines that the user has put a sheet of paper in the by-pass tray.

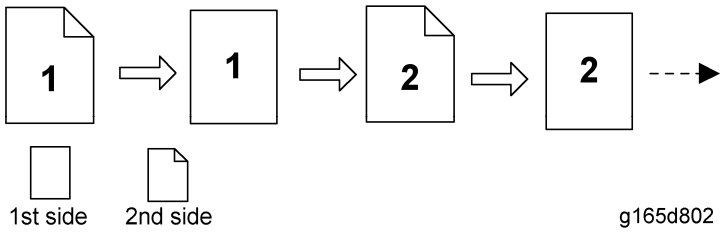
6.5.5 DUPLEX (G167/G183/G184 ONLY)

Drive



The duplex motor [A] feeds out paper to the output tray in single-sided mode and also feeds paper to the duplex path in duplex mode. When a sheet [B] of paper passes through the paper exit sensor [C] in duplex mode, the duplex motor stops and rotates in reverse. The paper exit roller [D] feeds a sheet of paper to the duplex path. The duplex transport roller [E], which is driven by the duplex motor through the timing belt, transports a sheet of paper to the registration roller.

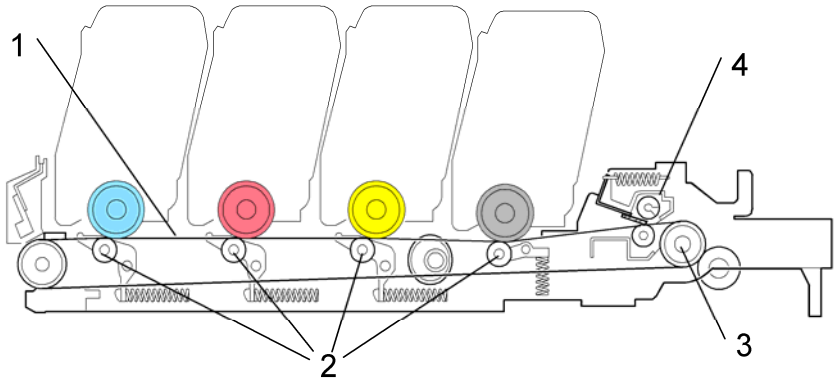
Duplex Operation



There is no interleaving in the PE-P1/MF1 models. The printing is done as shown above: 2nd side of 1st page ➔ 1st side of 1st page ➔ 2nd side of 2nd page ➔ 1st side of 2nd page ➔ ----.

6.6 IMAGE TRANSFER

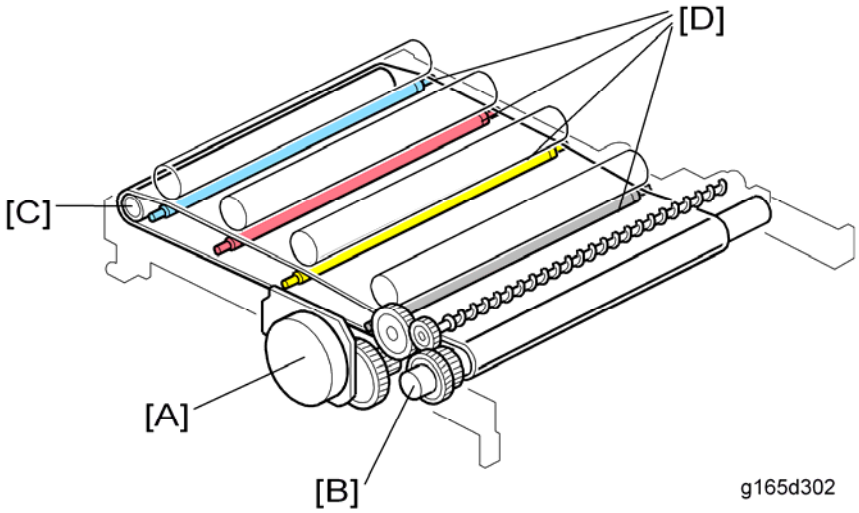
6.6.1 OVERVIEW



1. Image Transfer Belt	3. ITB Drive Roller
2. ITB (Image Transfer Belt) Roller	4. ITB Cleaning Unit

The toner is moved from the four OPC drums to the image transfer belt. For a full color print, all four colors are moved from the PCUs to the transfer belt at the same time. The transfer roller then moves the four-color toner image from the transfer belt to the paper.
The ITB cleaning unit removes remaining toner from the surface of the ITB after image transfer.

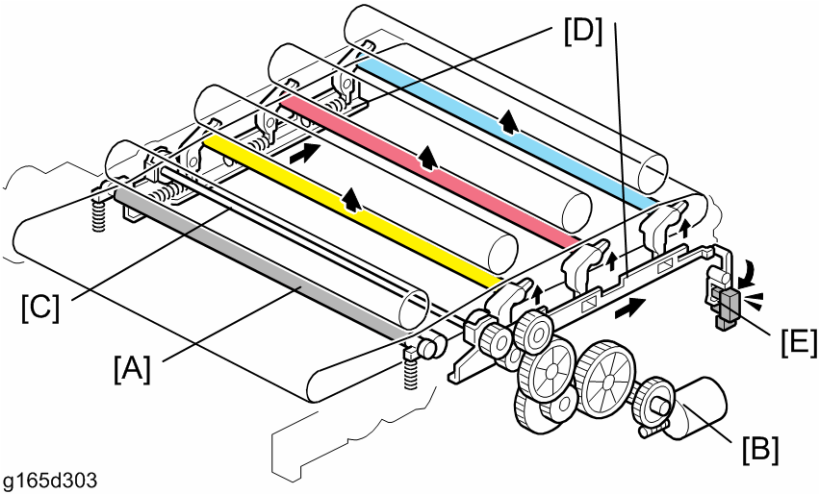
6.6.2 DRIVE AND TRANSFER BELT ROLLER BIAS



The black AIO motor [A] controls the transfer belt drive roller [B]. The belt tension roller [C] adds tension to the transfer belt to help to turn this belt.

The image transfer belt rollers [D] are charged from terminal plates to move the toner from the PCUs to the image transfer belt.

6.6.3 TRANSFER BELT CONTACT



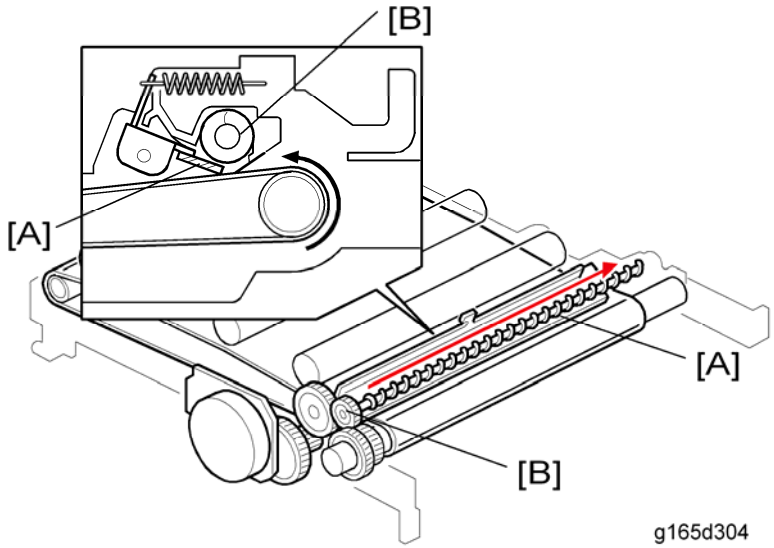
The transfer belt does not touch the color OPC drums (cyan, magenta and yellow) when the machine makes a black and white print.

The transfer belt contact motor [B] turns the CMY contact cam shaft [C] when the machine starts to make a color print. The CMY contact cams slide the right and left sliders [D] and these sliders lift the belt transfer rollers for each OPC drum (CMY) to the transfer belt.

Because of this mechanism, the life of the transfer belt is longer (it is not necessary for the transfer belt to touch the color OPC drums when the machine makes a black and white print). However, if the customer selects "Off" with the "ACS" setting, the four OPC drums always touch the image transfer belt.

The ITB (image transfer belt) contact sensor [E] detects if the image transfer rollers for each OPC drum (CMY) touch the transfer belt. If they do not touch the transfer belt during color printing, the machine stops and shows SC 445, 446, or 447.

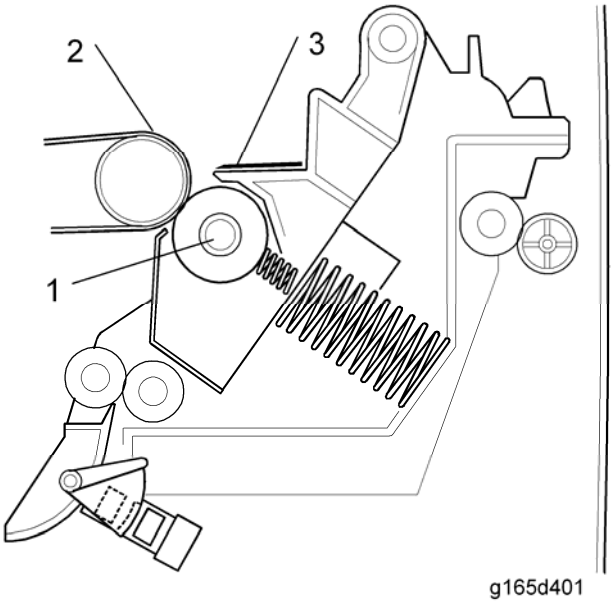
6.6.4 ITB (IMAGE TRANSFER BELT) CLEANING UNIT



The ITB cleaning blade [A] in the cleaning unit removes remaining toner on the image transfer belt after image transfer to the paper. The toner collection coil [B] moves the collected waste toner to the outlet for the waste toner bottle.

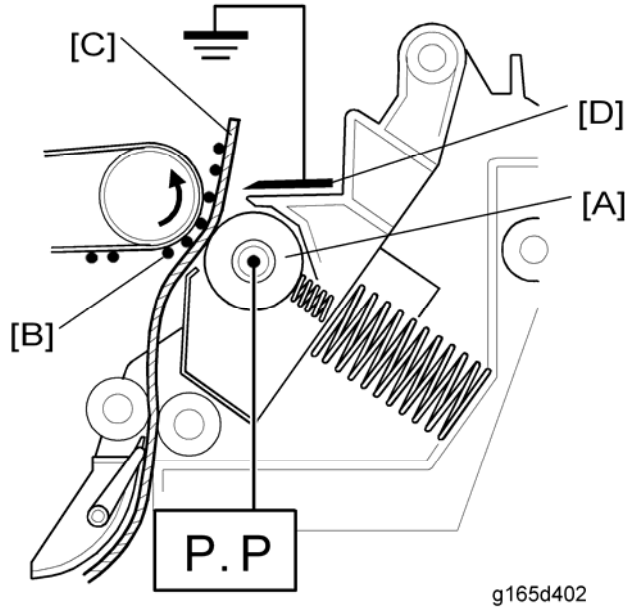
The ITB cleaning unit has a shutter mechanism at the outlet for the waste toner bottle. When the ITB unit is removed, the shutter closes the outlet to prevent waste toner from falling.

6.6.5 TRANSFER ROLLER OVERVIEW



1. Transfer Roller
2. Image Transfer Belt
3. Discharge Plate

6.6.6 PAPER TRANSFER AND DISCHARGE



Transfer Roller

The transfer roller [A] is always pressed against the image transfer belt by pressure from a spring. The transfer roller moves toner images [B] from the transfer belt to the paper. When a sheet of paper [C] goes between the transfer roller and the transfer belt, the transfer roller turns with the paper.

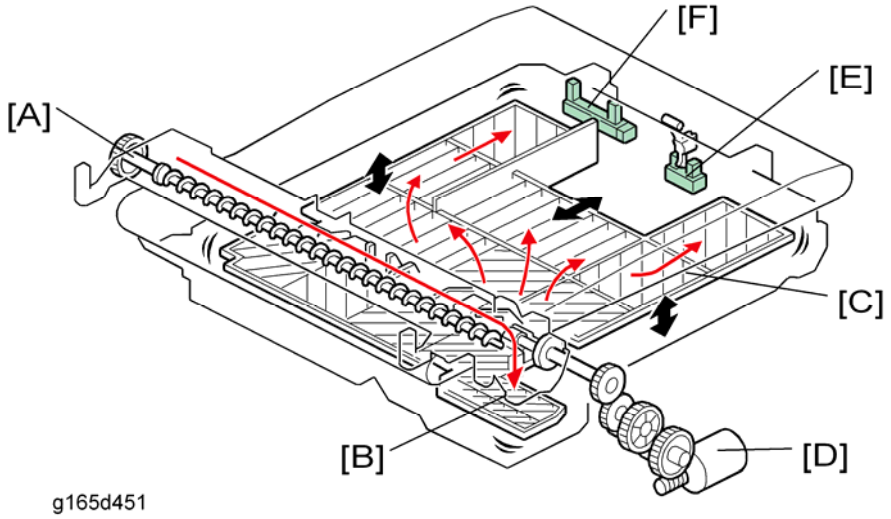
Paper Transfer Bias

The high voltage power supply (HVPS) supplies electricity to the transfer roller. The transfer roller is positively charged. The right end of the transfer unit is attached to the terminal from the HVPS when you close the front cover.

Discharge Plate

The transfer unit has a discharge plate [D] above the transfer roller. The discharge plate removes charge that was applied to the paper during paper transfer. This helps paper move away from the transfer roller.

6.6.7 WASTE TONER COLLECTION



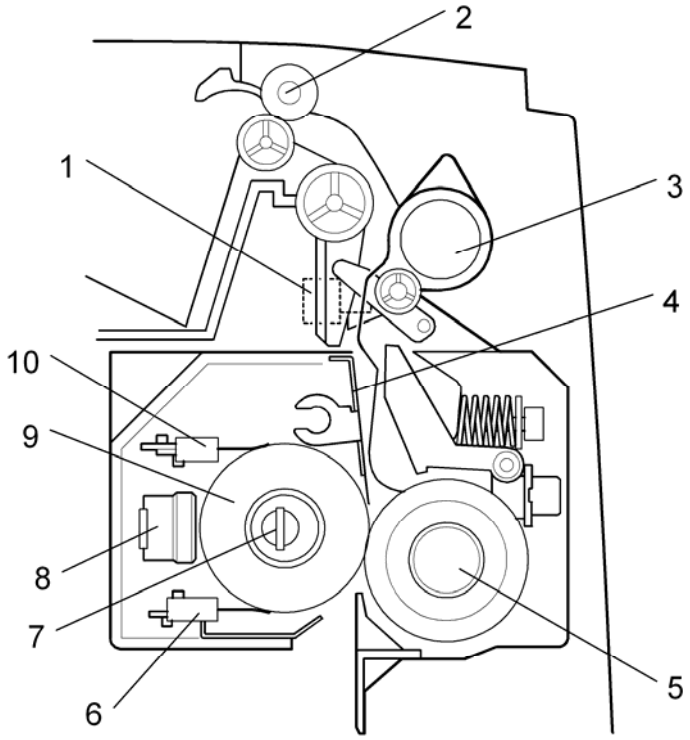
The waste toner collection coil [A] moves collected waste toner from the ITB (image transfer belt) unit to the entrance [B] of the waste toner bottle. The agitator plate [C] levels the collected waste toner in the waste toner bottle. It is driven by the agitator motor [D].

The waste toner bottle set sensor [E] detects whether the waste toner bottle is set. If it is not set, "Waste Toner Bottle" appears on the SOM (printer model) or LCD on the machine (MF model).

The waste toner overflow sensor [F] detects whether the waste toner bottle is full. If it is full, "Replace the Waste Toner Bottle" appears on the SOM (printer model) or LCD on the machine (MF model), 400 more pages can be printed, then the machine stops.

6.7 FUSING AND EXIT

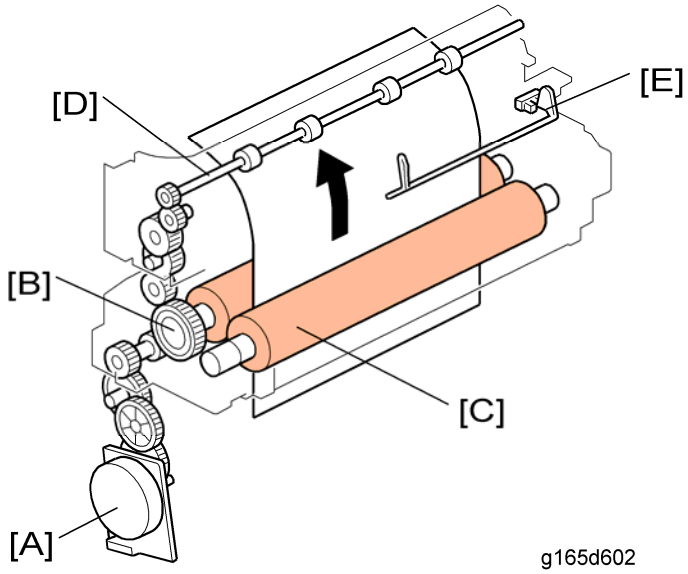
6.7.1 OVERVIEW



1. Paper Exit Sensor	6. Thermistor (Center)
2. Paper Exit Roller	7. Fusing Lamp
3. Pressure Release Lever	8. Thermostat
4. Stripper Plate	9. Hot Roller
5. Pressure Roller	10. Thermistor (Right)

6.7.2 DRIVE

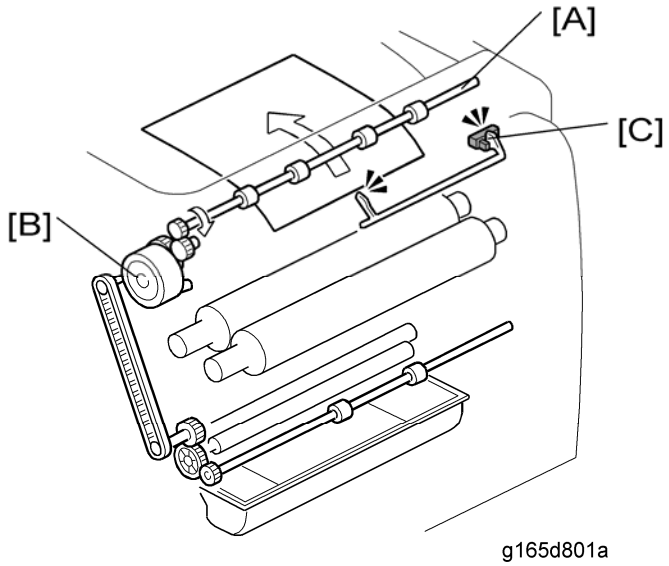
Models without Duplex (G165/G166: Printer model, G181: MF model)



g165d602

The transport/fusing motor [A] drives the hot roller [B], pressure roller [C] (this is an idle roller) and paper exit roller [D] (via gears). The paper exit sensor [E] detects the trailing edge of the paper to determine the stop timing for the transport/fusing motor. It also checks whether a paper jam occurs at the fusing unit or paper exit.

Models with Duplex (G167: Printer model, G183/G184 MF model)



g165d801a

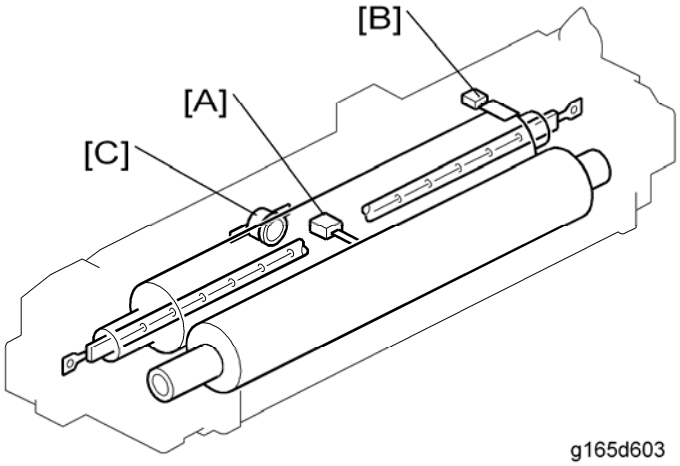
For models with duplex, the transport/fusing motor drives the hot roller (same as the models without duplex). However, the paper exit roller [A] is controlled by the duplex motor

[B]. This is because the duplex motor controls paper exit and feed in the duplex.
The paper exit sensor [C] detects the trailing edge of the paper to determine the stop timing for the transport/fusing motor, reverse timing, and stop timing for the duplex motor. It also checks whether a paper jam occurs at the fusing unit or paper exit.

6.7.3 PRESSURE RELEASE MECHANISM

The springs always apply the correct pressure to the nip between the pressure roller and hot roller. When releasing the pressure release levers, the pressure roller moves away from the hot roller. If a paper jam occurs in the fusing unit, releasing these levers make it easy to remove jammed paper.

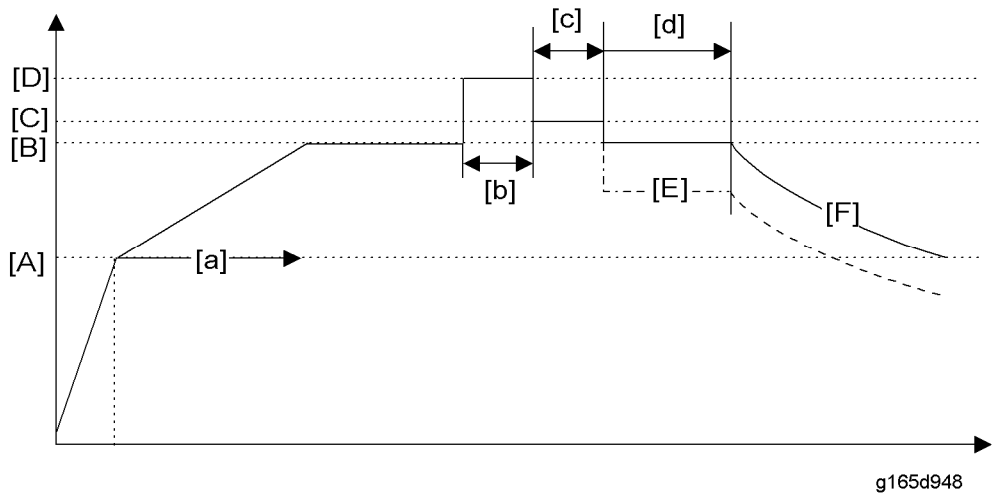
6.7.4 TEMPERATURE CONTROL



The fusing unit has these components for temperature control:

- The fusing thermistors [A] [B] send a signal when the fusing temperature goes past the threshold.
- The central thermistor [A] is the one that is used for fusing temperature control.
- The fusing thermostat [C] breaks the electric circuit when the fusing temperature goes past the threshold. The thermostat is on the same electrical circuit as the fusing lamp, so the fusing lamp goes off if the fusing thermostat breaks the electrical circuit.

Fusing and Exit



- [A]: Idling ready temperature (100°C)
  The fusing unit starts to rotate (idling) for 54 seconds [a].
- [B]: Print ready temperature (170°C)
  This is the temperature to wait for a print job [b].
- [C]: Target temperature after 1st print (This depends on the target temperature of each paper type; see the table below)
  The machine keeps this temperature for printing (c) after the 1st print time (d: 14 seconds).
- [D]: First print temperature (target temperature + 10°C)
  The machine keeps this temperature for the first printing time (d: 14 seconds).
- [E]: 10 seconds recovery temperature (155°C)
  This is the low power mode for printing. This temperature is lower than the target temperature [C] and saves power. This mode is adjustable (default: 15 minutes) with the "Power Saver" setting in the user mode.
- [F]: Sleep mode
  The machine turns off power to the engine unit for sleep mode after the machine has not received a print job for 15 minutes.

Target Temperature for Each Paper Type

Paper Type	Target Temperature
Thin	175°C
Plain 1	180°C
Recycled	180°C
Plain and Recycled	180°C
Plain 2	175°C
Thick 1	175°C
Cardstock	175°C
Bond	175°C
Envelopes	170°C

Fusing unit related SC codes

If one of the fusing unit components (such as thermistors, thermostat, fusing lamp etc.) is defective, the following SC codes may be issued. For details, refer to the SC code list in the chapter "Troubleshooting."

- SC541, 542, 543, 544, and 545

If one of these SC codes is issued, click or press "Fuser SC Reset" with SOM (printer model) or "Engine Maintenance" (MF model).

Anti-Humidity Mode

To reduce paper curl in high temperature and humidity environments, the fusing unit does idle rotation before a job, if the customer enables this function in the user mode.

- Mode 1: No fusing idling, transfer roller voltage is increased
- Mode 2: Fusing unit rotates for 30 seconds before a job, transfer roller voltage is increased.
- Mode 3: Fusing unit rotates for 60 seconds before a job, transfer roller voltage is increased.

Energy Saver

There are two modes for energy saving.

- Low power mode (Energy Saver Mode 1):
  This keeps the fusing temperature at 155°C for a specified time (adjustable with "Power Saver" in the user mode) while the machine waits for the next print job.
- Sleep mode (Energy Saver Mode 2):
  This turns off power to the engine unit after the time specified with "Power Saver" has passed.

6.8 CONTROLLER

6.8.1 OVERVIEW

The printer model has two types of controllers: GDI and PCL. The MF model has the main controller and the extension PDL controller.

Controller: Printer model (G165/G166/G167)

CPU	195MHz (PE-P1a) 300MHz (PE-P1b/c)		
RAM	Std.		64MB (PE-P1a) 128MB (PE-P1b/c)
	Max.		64MB (PE-P1a) 384MB (PE-P1b/c)*1
Hard Disk Drive	-		-
PDL	PE-P1a: DDST (GDI) PE-P1b/c: PCL5c/6, PostScript 3 emulation		
Fonts	Std.		PCL: 41 Symbolset, 35 Intellifonts, 10 TrueType fonts, 1 bitmap font. PS3: 80 fonts (PE-P1b/c)
Connectivity	Host Interface	Std.	USB2.0, 100BASE-TX/10BASE-T Ethernet, Pict Bridge (PE-P1c)
		Option	Non
	Network Protocol		TCP/IP (PE-P1a) TCP/IP, AppleTalk (PE-P1b/c)
	MIB support	Private MIB	

Controller

		Standard MIB (SMNP Printer MIB)	MIB-II (RFC1213), HostResource (RFC1514), PrinterMib (RFC1759)
	Operating Systems/Network		Windows 98se/NT4.0/2000/Me/XP/Server 2003
			Mac OS 9/x, 10.1-10.4

Print Resolution		
Engine		600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
Controller	PCL5c	600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
	PCL6	600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
	PS3	600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
Drivers	PCL5c	600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
	PCL6	600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
	PS3	600 x 600 dpi, 1200 x 600 dpi, 2400 x 600 dpi
Language		
Operation Panel	-	-
Drivers	PCL5c/PCL6	1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Czech, 11.Hungarian, 12.Finnish, 13.Polish, 14.Portuguese, 15.Russian, 16.Simplified Chinese, 17. Traditional Chinese
	PS3	1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Czech, 11.Hungarian, 12.Finnish, 13.Polish, 14.Portuguese, 15.Russian, 16.Simplified Chinese, 17. Traditional Chinese

Test Page Print	Config. Map	1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Czech, 11.Hungarian, 12.Finnish, 13.Polish, 14.Portuguese
	The others	English,

Controller: MF model (G181/G183/G184)

CPU	ARM11 400MHz		
RAM	Std.		PE-MF1a/b: 128MB, PE-MF1c: 256MB (128MB for printer function)
	Max.		512MB (Only PE-MF1c, 384MB for printer function)
Hard Disk Drive	-		-
PDL	PE-MF1a/b: DDST (GDI) PE-MF1c: PCL5c/6, PostScript 3 emulation		
Fonts	Std.		PCL: 41 Symbolset, 35 Intellifonts, 10 TrueType fonts, 1 bitmap font. PS3: 80 fonts (Only PE-MF1c)
Connectivity	Host Interface	Std.	USB2.0, 100BASE-TX/10BASE-T Ethernet
		Option	None
	Network Protocol		TCP/IP, IPP
	MIB support	Private MIB	Original
		Standard MIB (SMNP Printer MIB)	MIB-II (RFC1213), HostResource (RFC1514), PrinterMib (RFC1759)
	Operating Systems/Network		Windows 98SE/Me/2000/XP/Server 2003/Vista*1
			Mac OS X 10.2.8 or later

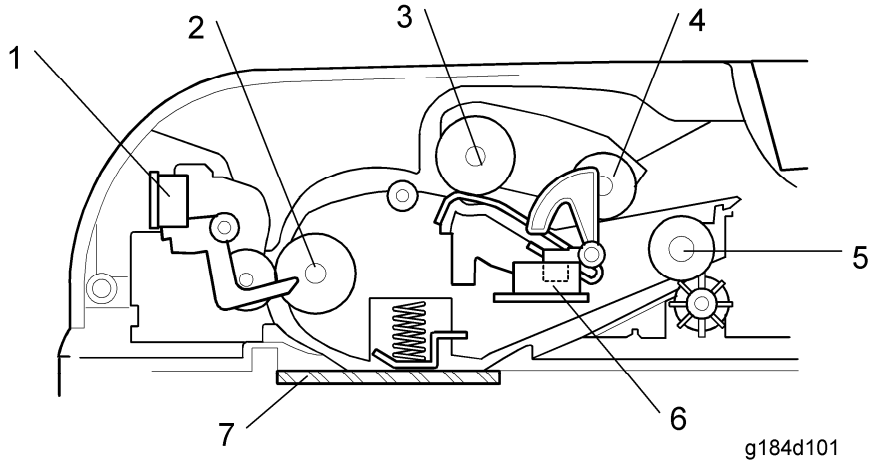
Print Resolution		
Engine		600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent
Controller	PCL5c	600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent
	PCL6	600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent
	PS3	600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent
Drivers	PCL5c	600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent
	PCL6	600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent
	PS3	600 x 600 dpi, 1200 x 600 dpi equivalent, 2400 x 600 dpi equivalent

Controller

Language		
Operation Panel (LCD)		1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Finnish, 11.Portuguese
Drivers	PCL5c/PCL6	1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Czech, 11.Hungarian, 12.Finnish, 13.Polish, 14.Portuguese, 15.Russian, 16.Simplified Chinese
	PS3	1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Czech, 11.Hungarian, 12.Finnish, 13.Polish, 14.Portuguese, 15.Russian, 16.Simplified Chinese
	GDI	1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Czech, 11.Hungarian, 12.Finnish, 13.Polish, 14.Portuguese, 15.Russian, 16.Simplified Chinese
Config. Page		1.English, 2.German, 3.French, 4.Italian, 5.Spanish, 6.Dutch, 7.Swedish, 8.Norwegian, 9.Danish, 10.Finnish, 11.Portuguese

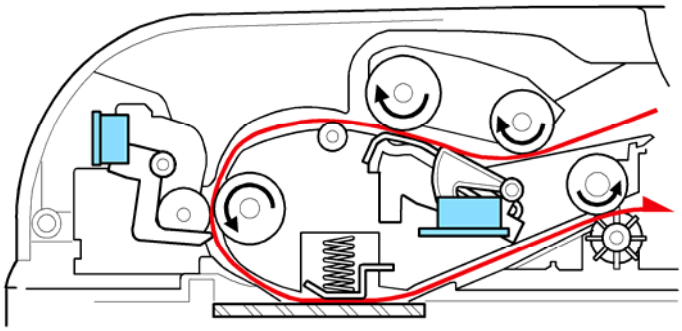
6.9 ADF

6.9.1 OVERVIEW



1. Feed Sensor 2. Feed Roller 3. Separation Roller 4. Pick-up Roller	5. Exit Roller 6. Original Set Sensor 7. DF Exposure Glass

6.9.2 PAPER PATH



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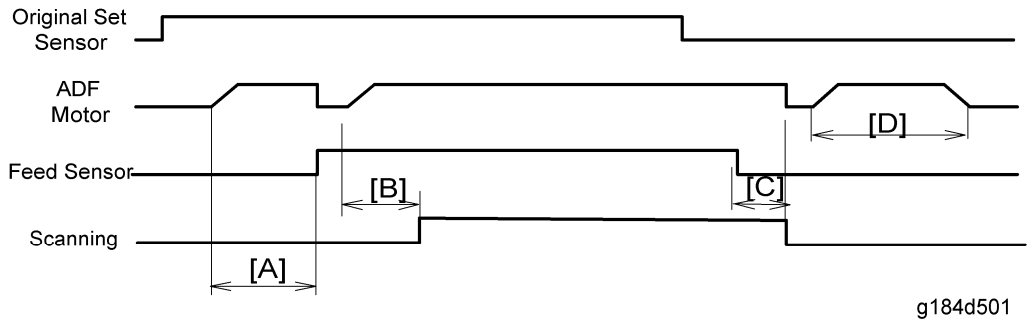
After the original set sensor has detected an original and the machine has received a copying or scanning job, the ADF motor rotates to pick up and feed a sheet of the original to the feed sensor. If the feed sensor does not detect paper after this sequence, the machine determines an original jam has occurred.

The ADF motor stops when the feed sensor detects paper, and then starts to rotate again. After scanning, the ADF motor stops again, and then starts to rotate to feed out the paper.

6.9.3 TIMING CHART

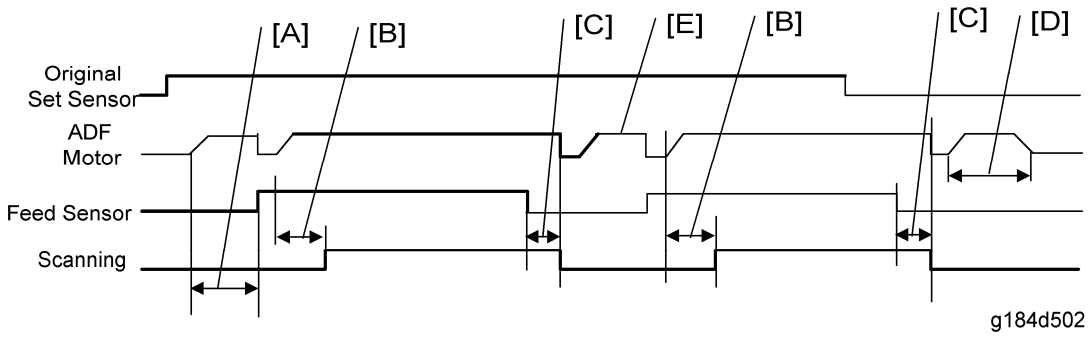
Single page



(Upper line: ON, Lower line: OFF)

- [A]: Checks for a Feed-in Jam (40000 pulses)
- [B]: Number of pulses for motor start to Start Scanning
- [C]: Number of pulses for Paper Sensor Off to Stop Scanning
- [D]: Number of pulses for Paper feed out

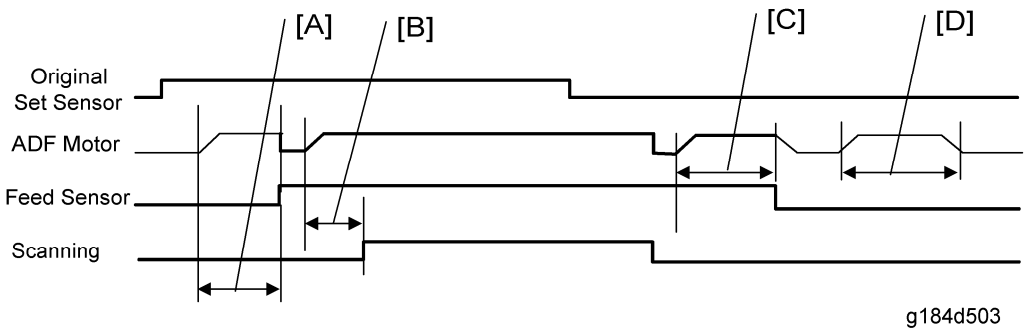
Multiple pages



(Upper line: ON, Lower line: OFF)

- [A]: Checks for a Feed-in Jam (40000 pulses)
- [B]: Number of pulses for motor start to Start Scanning
- [C]: Number of pulses for Paper Sensor Off to Stop Scanning
- [D]: Number of pulses for Paper feed out
- [E]: Paper feed

Feed out jam detection

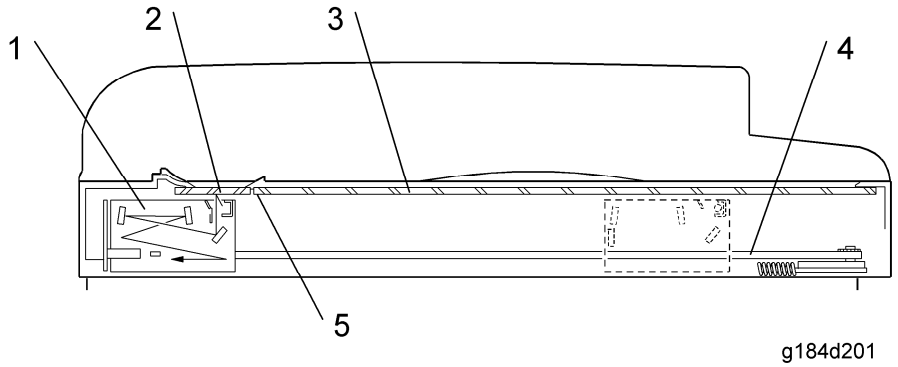


(Upper line: ON, Lower line: OFF)

- [A]: Checks for a Feed-in Jam (40000 pulses)
- [B]: Number of pulses for motor start to Start Scanning
- [C]: Checks for a Feed-out Jam (40000 pulses)
- [D]: Number of pulses for Paper feed out

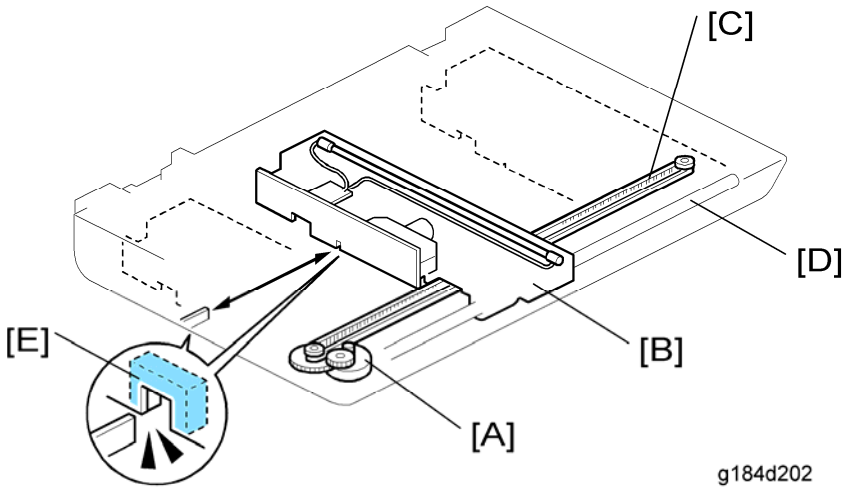
6.10 SCANNER

6.10.1 OVERVIEW



1. Scanner Carriage Unit 2. DF Exposure Glass 3. Exposure Glass	4. Carriage Drive Bar 5. White Plate

6.10.2 DRIVE



The scanner motor [A] drives the scanner carriage unit [B] through gears and a timing belt [C]. The scanner carriage unit moves along the carriage drive bar [D].

The carriage home position sensor [E] in the scanner carriage unit detects the home position when initializing the scanner or before/after scanning. The scanner carriage unit moves to read the white plate every scan to adjust white level (ADS).

SPECIFICATIONS

7. SPECIFICATIONS

7.1 GENERAL SPECIFICATIONS

7.1.1 PRINTER MODEL

PE-P1a: G165, PE-P1b: G166, PE-P1c: G167

Type			Desktop
Technology			Laser beam scanning and electro-photographic printing
			Mono-component toner development
			4-drum tandem method
Resolution (dpi)			600 × 600 dpi Speed (1bit) 600 × 600 dpi Standard (2bits) 600 × 600 dpi Fine (4bits)
Printing Speed	General Paper	A4/LT	FC: PE-P1a:16ppm (LT:16.5ppm) FC: PE-P1b/c:20ppm (LT:21ppm)
First Print Speed	Mono		14.0 sec or less
(A4/LT, SEF, Std. Tray)	F/C		14.0 sec or less
Duplex Printing	A4, LT, B5, LG, Exe		PE-P1a/b: Manual, PE-P1c: Auto
Dimensions (W x D x H)			400 x 450 x 320 mm / 16.0 x 18.0 x 12.8 inch
Weight			22.0 kg/ 48.4lb, Includes consumables.
Input capacity	Standard	Std Tray	250 sheets
		Bypass tray	1 sheet

General Specifications

	Op. Paper Tray	Paper Feed Unit	PE-P1b/c: 500 sheets x 1
	Max		PE-P1a: up to 251 sheets, PE-P1b/c: up to 751 sheets
Output capacity	Standard Tray	Face down	Up to 150 sheets (A4/LT or 80g/m^2,20lb)
Input Paper Size	Standard Tray		A4,B5,A5,B6,A6,Legal,Letter,HLT,Exective, Foolscap, Folio Custom size: Min. 90mm x 148mm (3.6" x 5.92"), Max. 216mm x 356mm (8.64" x 14.24")
	Bypass Tray		A4,B5,A5,B6,A6,Legal,Letter,HLT,Exective, Foolscap, Folio Custom size: Min. 90mm x 148mm (3.6" x 5.92"), Max. 216mm x 356mm (8.64" x 14.24")
	Op. Paper Tray		A4, Letter
Media Type		Std.Tray	Plain Paper, Recycled Paper, Application Paper, Envelope, Glossy, Thick Paper, Label
		Bypass Tray	Plain Paper, Recycled Paper, Application Paper, Envelope, Glossy, Thick Paper, Label
		Op.Paper Feed Unit	Plain Paper, Recycled Paper
Paper Weight	Standard Tray		60-160g/m^2 (16-40lb)
	Bypass tray		60-160g/m^2 (16-40lb)
	Op. Paper Tray	Paper Feed Unit	60-105g/m^2 (16-28lb)
Rating Power Spec.	NA version		120V, 60Hz
	EU version		230V, 50/60Hz

Power Consumption	NA version	Max.	1300W or less
		Energy Saver	15 W or less
	EU version	Max.	1300W or less
		Energy Saver	15 W or less
Warm-up Time			51 sec or less (from power on)
Energy Save Mode	Sleep Mode		51 sec (Uses approx 15W)
	Low Power Mode		10 sec (Uses approx 100W)

7.1.2 MF MODEL

Engine

PE-MF1a: G181, PE- MF1b: G183, PE- MF1c: G184

Type			Desktop
Technology			Flatbed with CCD array image-sensor
			Laser beam scanning and electro-photographic printing
			Mono-component toner development
			4-drum tandem method
Resolution (dpi, bit/pixel)			600 × 600 dpi Speed (1bit) 600 × 600 dpi Standard (2bits) 600 × 600 dpi Fine (4bits)
Printing Speed	General Paper	A4/LT	BW/FC: PE-MF1a:16ppm (LT:16.5ppm) BW/FC: PE-MF1b/c:20ppm (LT:21ppm)
First Print Speed (A4/LT, SEF, Std. Tray)	Mono		14.0 sec or less
	F/C		14.0 sec or less
Duplex Printing	A4, LT, B5, LG, Exe		PE-MF1a: Manual PE-MF1b/c: Auto
Dimensions (W x D x H)	PE-MF1a		420 x 493 x 439 mm
	PE-MF1b/c		420 x 493 x 476 mm
Weight			PE-MF1a: 28.0 kg PE-MF1b/c: 30 kg *Includes consumables.
Input capacity	Standard	Std Tray	250 sheets (80 g/m^2)
		Bypass tray	1 sheet

	Op. Paper Tray	Paper Feed Unit	PE- MF 1b/c: 500 sheets (80 g/m^2) x 1
	Max		PE-MF1a: up to 251 sheets, PE- MF 1b/c: up to 751 sheets
Output capacity	Standard Tray	Face down	up to 150 sheets (A4/LT or 80g/m^2, 20lb)
Input Paper Size	Standard Tray		A4, B5, A5, B6, A6, Legal, Letter, HLT, Executive, Foolscap, Folio Custom size: Min. 90mm x 148mm (3.6" x 5.92"), Max. 216mm x 356mm (8.64" x 14.24")
	Bypass Tray		A4, B5, A5, B6, A6, Legal, Letter, HLT, Executive, Foolscap, Folio Custom size: Min. 90mm x 148mm (3.6" x 5.92"), Max. 216mm x 356mm (8.64" x 14.24")
	Op. Paper Tray		A4, Letter
Media Type		Std.Tray	Plain Paper, Recycle Paper, Application Paper, Envelope, Glossy, Thick Paper, Label
		Bypass Tray	Plain Paper, Recycle Paper, Application Paper, Envelope, Glossy, Thick Paper, Label
		Op.Paper Feed Unit	Plain Paper, Recycle Paper
Paper Weight	Standard Tray		60-160g/m^2 (16-40lb)
	Bypass tray		60-160g/m^2 (16-40lb)
	Op. Paper Tray	Paper Feed Unit	60-105g/m^2 (16-28lb)

General Specifications

ADF	Capacity		35 sheets (80g/m^2, 20lb)
	Original size		Letter/A4: Width 139.7-215.9 mm (5.5" - 8.5"), Length: 139.7-355.6 mm (5.5" - 14")
	Original weight		52 - 105 g/m^2 (14 - 28lbs.)
Rating Power Spec.	NA version		120V, 60Hz
	EU version		220 to 240V, 50/60Hz
Power Consumption	NA version	Max.	1300W or less
		Energy Saver	PE-MF1a/b 20 W or less PE-MF1c 25 W or less
	EU version	Max.	1300W or less
		Energy Saver	PE-MF1a/b 20 W or less PE-MF1c 25 W or less
Warm-up Time			51 sec or less (from power on)
Energy Save Mode	Sleep Mode		51 sec (Uses approx 15W)
	Low Power Mode		10 sec (Uses approx 100W)

Copier

1st copy speed		Platen/ADF	B&W: Less than 30 sec. FC: Less than 30 sec.
Maximum original size		Platen	A4 (210 x 297mm) / Letter (215.9 x 279.4mm)
		ADF	A4 (210 x 297mm) / Letter (215.9 x 279.4mm)/ Legal (215.9 x 355.6mm)
Copy Speed	Single Document Multiple Copy	Platen	PE-MF1a: B/W: 16 cpm (A4), 16.5 cpm (LT) FC: 16 cpm (A4), 16.5 cpm (LT) PE-MF1b/c: B/W: 20 cpm (A4), 21 cpm (LT) FC: 20 cpm (A4), 21 cpm (LT)
		ADF	PE-MF1b/c: B/W: 20 cpm, FC: 20 cpm (A4), B/W: 21 cpm, FC: 21 cpm (LT)
	Multiple Document Single Copy	ADF	PE-MF1b/c: B/W: 20 cpm, FC: 10 cpm
Multiple copy			Up to 99
Resolution (H x V)		Scanning	600 x 600 dpi (Flatbed), 600 x 300 dpi (ADF)
		Printing	600 x 600 dpi
Grayscale			256 levels
Reduction / Enlargement		Fix	NA: 50, 65, 78, 93, 129, 155, 200, 400% EU: 50, 71, 82, 93, 122, 141, 200, 400%

General Specifications

	Custom	25 – 400% in 1% steps
Image density adjustment		Yes, Manual only: 5 levels
Copy mode		Text/Photo/Mixed
Memory copy		Yes
Auto-duplex copy		No
Interrupt copy		No
Combine copy		2 in 1, 4 in 1 (Only ADF)
APS/AMS		No/No
Auto Tray Switch		No
Directional Magnification		No
Directional Size Magnification		No
Photo Mode		Yes
Auto Start		No
User Program		No
Electronic Sorting		Standard (collation, ADF only)
Image Rotation		No
Series Copy		No

Scanner

Scanning Device		CCD array image-sensor
Resolution		Scanner: 1200 x 1200 dpi
		Driver: Max. 19200 x 19200 dpi (interpolated)
Gray scale		256 levels
Scan modes/ speed (A4, 300dpi, USB2.0)		▪ ADF: B/W: less than 5 sec. / Gray Scale: less than 5 sec. / Color: less than 10 sec ▪ Platen B/W: less than 5 sec. / Gray Scale: less than 5 sec. / Color: less than 10 sec
Maximum original size	Platen	Width max: Up to 216mm, Length max: Up to 297mm
	ADF	Width max: Up to 216mm, Length max: Up to 356mm
Scan Depth		48bit color processing (input), 24bit color processing (output)
PC Interface		USB2.0, 10/100Base-TX
TWAIN Compliment		TWAIN, WIA
Scanner utilities and Drivers		TWAIN Driver, Scanner utility (PageManager)

Fax

Circuit	PSTN/ PABX
Compatibility:	ITU-T Group 3
Coding system:	MH/MR/MMR
Modem speed:	Automatic Fallback: 33600 bps
Document size:	Platen: A4/ LT/ LG Width max: 216 mm (8.5"), Length max: 297 mm (11.7") ADF: A4/ LT/ DLT Width: 139.7-215.9mm (5.5” - 8.5”) Length: 139.7-355.6 mm (5.5” - 14”)
Scanning width:	Max. 210 mm (8.3")
Printing width:	Max. 208 mm (8.2")
Gray scale:	256 levels
Polling type:	Standard, Sequential
Contrast control:	Normal/Light/Dark (manual setting)
Resolution:	8 x 3.85/ 8 x 7.7 lines/mm 200 x 100/ 200 x 200 dpi
Scanning Speed	Less than 5 sec. (A4 SEF, 200 dpi)
Modem Speed	Automatic Fallback: 33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400bps
Transmission Speed	Approx. 3 sec *ITU No.1 chart, Compression: MMR, Resolution: Standard, Speed: 33.6kbps
SAF Memory	100 pages (ITU No.1 chart, Compression: MMR, Resolution: Standard)
Memory Backup	1 hour

One-touch dial:	20 (10 x 2)
Broadcasting:	100 stations
Communication source:	Public switched telephone network
PC Fax utility:	Not available
Automatic re-dial	5/4/3/2 times after 5 minutes (Default 5 times)
Auto Answer	1-99 rings (Default 2 rings)

7.1.3 OPTION

Paper Feed Unit

Paper Tray (500x1)	Paper Size	A4,Letter
	Paper Weight	60-105g/m^2 (16-28lb)
	Paper capacity	500 sheets x 1 tray
	Dimensions (W x D x H)	400 x 450 x 127mm/16 x 18 x 5.08 inch
	Weight	6 kg/13.2 lb

7.2 SUPPORTED PAPER SIZES

A	Supported and the size is molded in the tray. Need to select paper size by operation panel/driver.
B	Supported but size is not molded in the tray. Need to select paper size by operation panel/driver.
C	Need to input paper size by operation panel and driver.
N	Not supported.

Type		**SEF/ LEF**	**Size**	**Input Tray**			Auto. Dup.*[1]
				Standard Tray	Option Paper Feed Unit	Bypass Tray	
Plain Paper	A4	SEF	210x297	A	A	B	Y
		LEF	297x210	N	N	N	N
	B5	SEF	182x257	A	N	B	Y
		LEF	257x182	N	N	N	N
	A5	SEF	148x210	A	N	B	N
		LEF	210x148	N	N	N	N
	B6	SEF	128x182	B	N	B	N
		LEF	182x128	N	N	N	N
	A6	SEF	105x148	B	N	B	N
		LEF	148x105	N	N	N	N
	DLT	SEF	11" x 17"	N	N	N	N

Type		SEF/ LEF	Size	Input Tray			Auto. Dup.*[1]
				Standard Tray	Option Paper Feed Unit	Bypass Tray	
	Legal	SEF	8 1/2”x14”	A	N	B	Y
	Letter	SEF	8 1/2”x11”	A	A	B	Y
		LEF	11”x 8 1/2”	N	N	N	N
	Half Letter	SEF	5 1/2” x 8 1/2”	C	N	C	N
	Executive	SEF	7 1/4”x10 1/2”	A	N	B	Y
		LEF	10 1/2”x7 1/4”	N	N	N	N
	F	SEF	8” x 13”	B	N	B	N
	Foolscap	SEF	8 1/2” x 13”	B	N	B	N
	Folio	SEF	8 1/4” x 13”	B	N	B	N
	8 Kai	SEF	267 x 390	N	N	N	N
	16 Kai	SEF	195 x 267	C	N	C	N
		LEF	267 x 195	N	N	N	N
Envelope	Com10	SEF	4 1/8” x 9 1/2”	C	N	C	N
	Monarch	SEF	3 7/8” x 7 1/2”	C	N	C	N
	C6	SEF	114 x 162	C	N	C	N
	C5	SEF	162 x 229	C	N	C	N

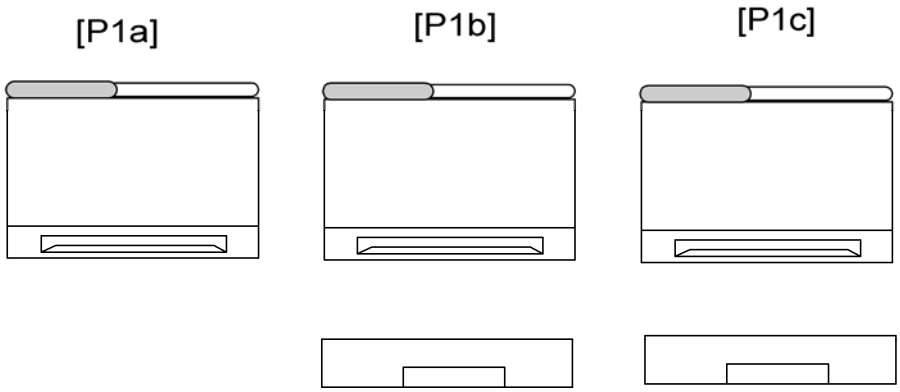
Supported Paper Sizes

Type		SEF/ LEF	Size	Input Tray			Auto. Dup.*1
				Standard Tray	Option Paper Feed Unit	Bypass Tray	
	DL Env	SEF	110 x 220	C	N	C	N
Custom		Width	90-216mm (3.6”x 8.5”)	C	N	C	N
	Length	148 – 356mm (5.8”x 14.24”)	C	N	C	N	

*1: Automatic duplex cannot be used in MF copy mode.

7.3 MACHINE CONFIGURATION

7.3.1 PRINTER MODEL (G165/G166/G167)



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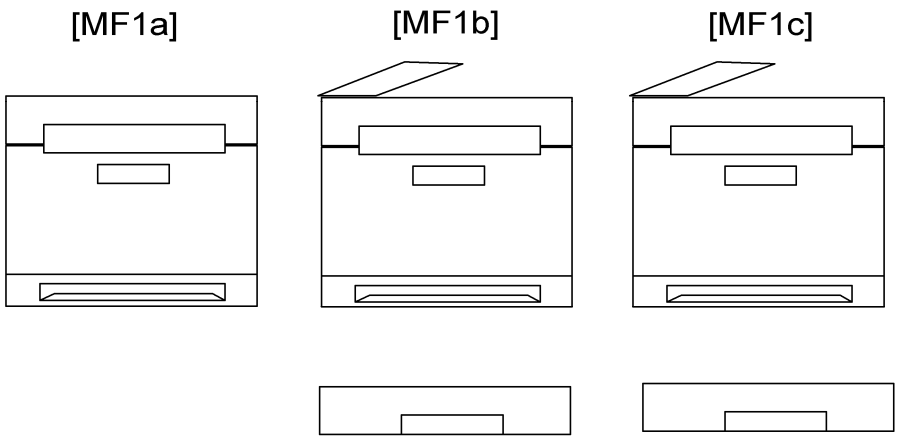
Models	Duplex Unit	Optional Memory	Optional Tray (G849)	DDST (GDI)	PCL PS
PE-P1a (G165)	Manual	N	N	Y	N
PE-P1b (G166)	Manual	Y	500x1	N	Y
PE-P1c (G167)	Auto	Y	500x1	N	Y

7.3.2 MF MODEL (G181/G183/G184)



g184v501

Machine Configuration

Models	Duplex Unit	Optional Memory	Optional Tray (G849)	DDST (GDI)	PCL PS	Fax
PE-MF1a (G181)	Manual	N	N	Y	N	N
PE-MF1b (G183)	Auto	N	500x1	Y	N	Y
PE-MF1c (G184)	Auto	Y	500x1	N	Y	Y

PAPER FEED UNIT TK1010
(G849)

PAPER FEED UNIT TK1010 (G849)

TABLE OF CONTENTS

1. REPLACEMENT AND ADJUSTMENT 1

1.1 PAPER FEED UNIT 1

1.1.1 TOP COVER 1

1.1.2 PAPER FEED AND RELAY CLUTCH 1

1.1.3 PAPER END AND RELAY SENSOR 2

1.1.4 PAPER FEED ROLLER 3

When reassembling 4

1.1.5 FRICTION PAD 5

When reassembling 5

2. DETAILED SECTION DESCRIPTIONS 7

2.1 OVERVIEW 7

2.1.1 COMPONENT LAYOUT 7

2.2 BASIC OPERATION 8

2.2.1 PAPER SEPARATION AND FEED 8

2.2.2 PAPER LIFT 9

2.2.3 PAPER END DETECTION 10

Read This First

Safety and Symbols

Replacement Procedure Safety

⚠CAUTION

- Turn off the main power switch and unplug the machine before beginning any of the replacement procedures in this manual.

Symbols Used in this Manual

This manual uses the following symbols.

☛: See or Refer to

: Screws

: Connector

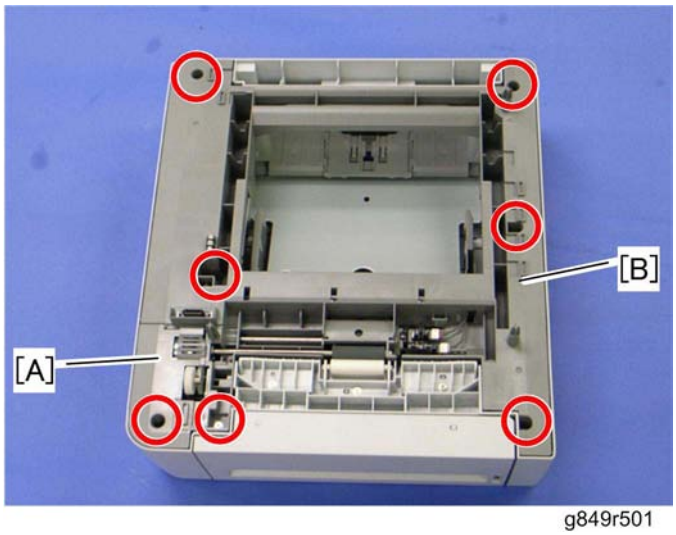
: Clip ring

: E-ring

1. REPLACEMENT AND ADJUSTMENT

1.1 PAPER FEED UNIT

1.1.1 TOP COVER

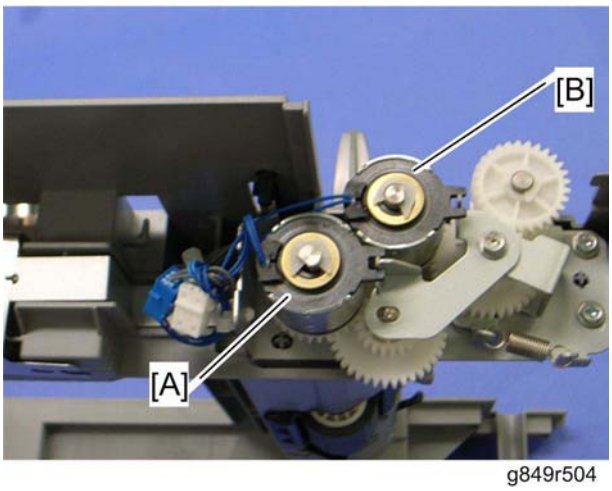


g849r501

1. Top left cover [A] (x 1)
2. Top cover [B] (x 6)

1.1.2 PAPER FEED AND RELAY CLUTCH

1. Top cover (☛ Top Cover)

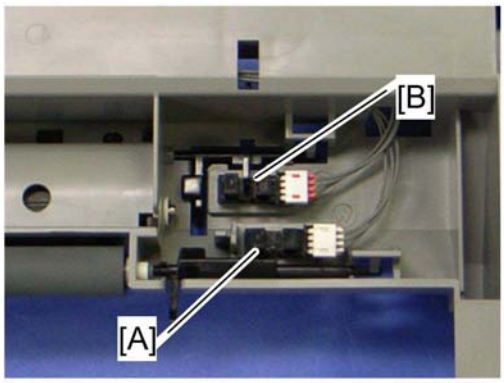


g849r504

2. Paper feed clutch [A] (x 1, x 1)
3. Relay clutch [B] (x 1, x 1)

1.1.3 PAPER END AND RELAY SENSOR

1. Top cover (☛ Top Cover)



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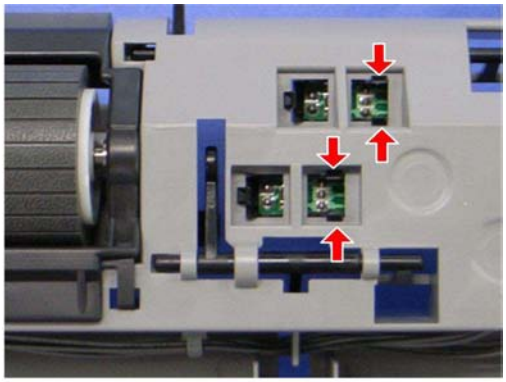
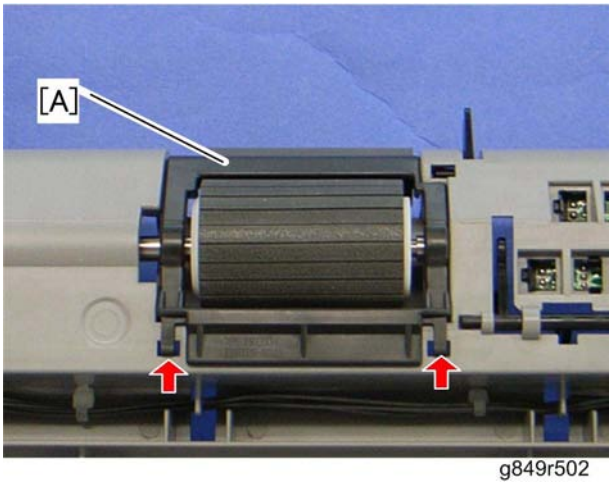

g849r506

2. Paper end sensor [A] (hooks, ☜ x 1)
3. Relay sensor [B] (hooks, ☜ x 1)

1.1.4 PAPER FEED ROLLER

1. Top cover (☛ Top Cover)
2. Paper feed clutch (☛ Top Cover)



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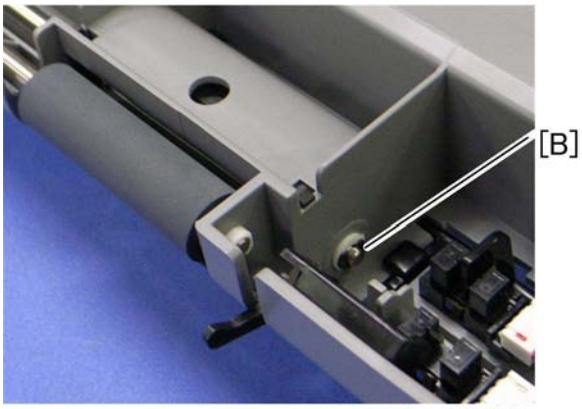
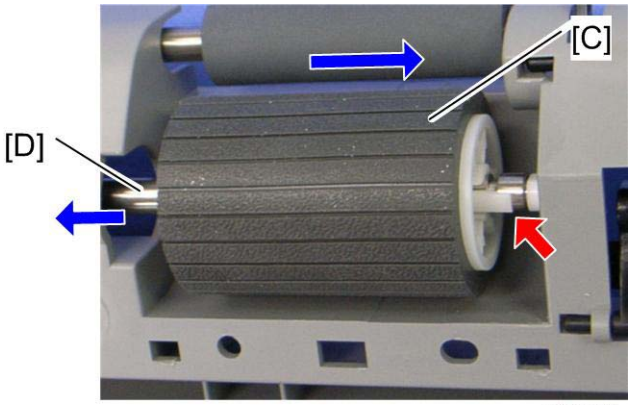
3. Paper guide [A] (hooks)



g849r503

4. Remove the e-ring [B] at the right edge of the feed roller shaft.



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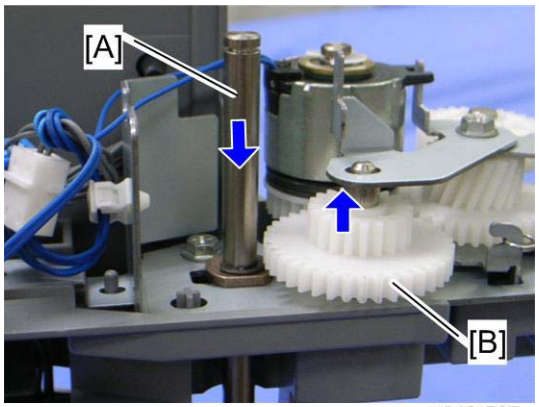
5. Slide the paper feed roller [C] to the right side (hook).
6. Pull out the feed roller shaft [D] to the left side (bushing x 1).

When reassembling



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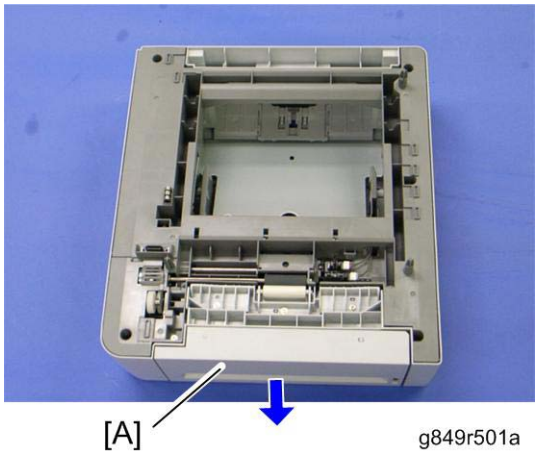
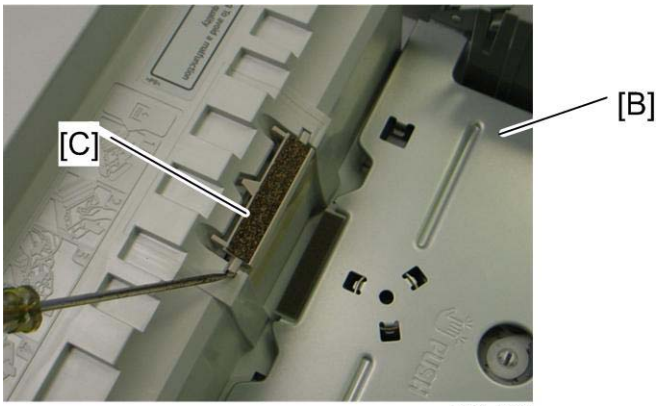
If the feed roller shaft [A] cannot be inserted easily, pull the gear [B], and then insert the feed roller shaft.

1.1.5 FRICTION PAD



g849r501a

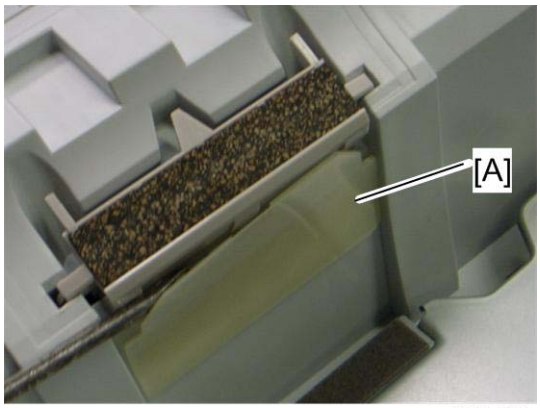
1. Pull out the tray [A]



g849r508

2. Press down the bottom plate [B]
3. Friction pad [C] (hooks, spring x 1)

When reassembling



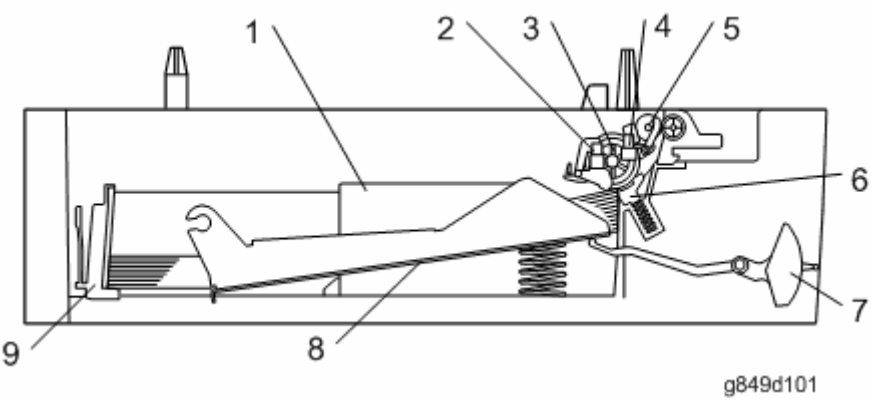
g849r509

When re-installing the friction pad, make sure that the mylar [A] does not go under the friction pad.

2. DETAILED SECTION DESCRIPTIONS

2.1 OVERVIEW

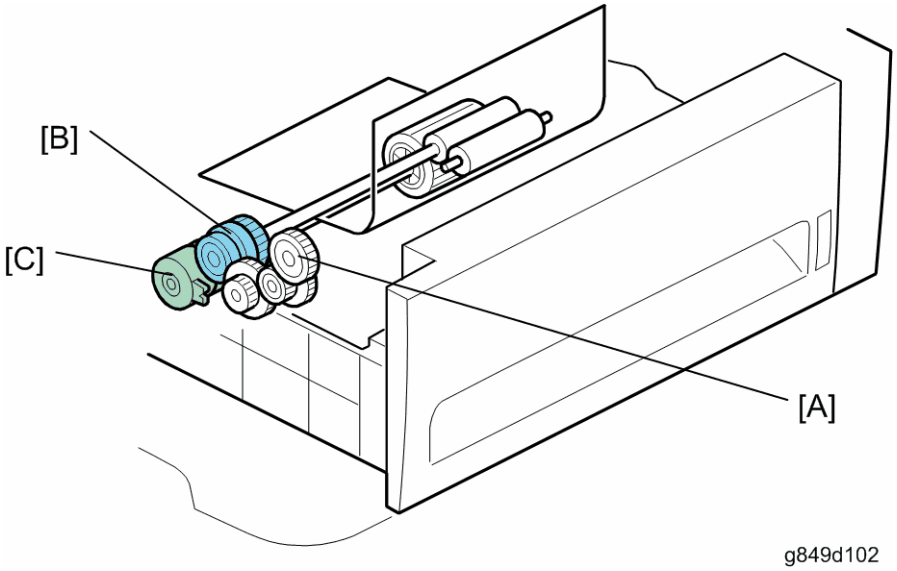
2.1.1 COMPONENT LAYOUT



1. Side Fence 2. Paper End Sensor 3. Paper Feed Roller 4. Relay Sensor 5. Relay Roller	6. Friction Pad 7. Paper Height Lever 8. Bottom Plate 9. Rear Fence

2.2 BASIC OPERATION

2.2.1 PAPER SEPARATION AND FEED



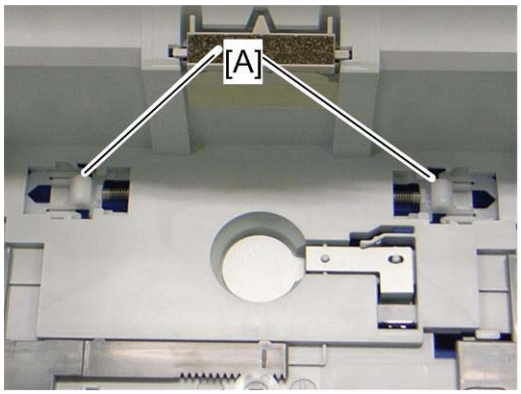
The paper tray holds 500 sheets of paper.

The paper feed unit uses a friction pad system.

The gear [A] is driven by the transport/fusing motor in the mainframe.

The relay clutch [B] and paper feed clutch [C] control drive from the mainframe. When the optional tray is selected as the feed tray, the relay clutch and paper feed clutch transmit drive power to the relay roller and paper feed roller.

2.2.2 PAPER LIFT



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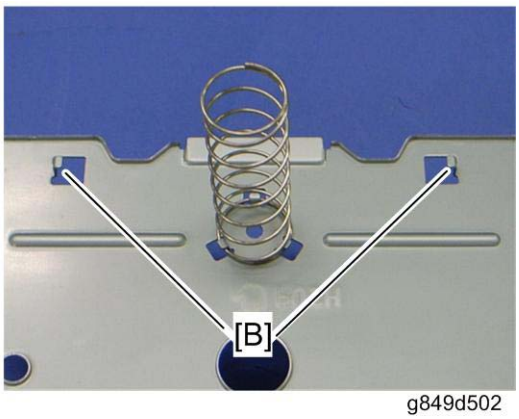

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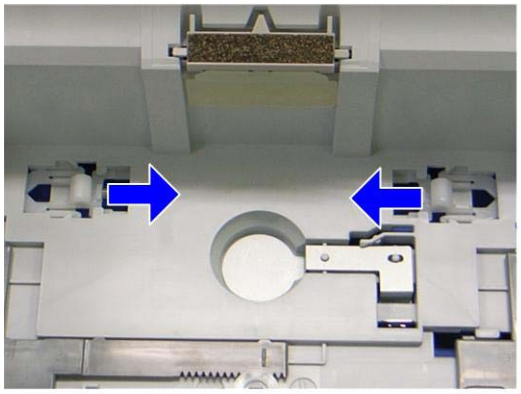
The bottom plate is always pressed up by the spring in the tray. Therefore, you must press down the bottom plate when you insert the tray in the machine.

The bottom tray lock levers [A] hold the tabs [B] under the bottom plate after the bottom plate is pressed down.



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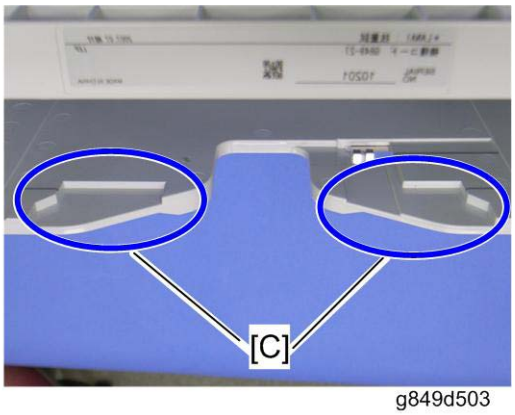

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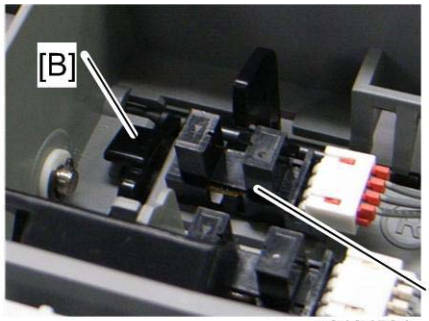
When the tray is inserted in the machine, the lock lever guides [C] in the paper feed unit push the bottom plate lock levers, and then the lock levers release the tabs under the bottom plate. As a result, the bottom plate is lifted by the spring.

2.2.3 PAPER END DETECTION



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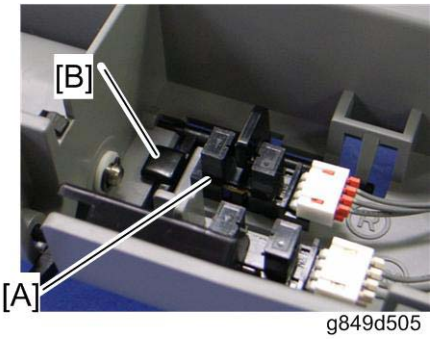

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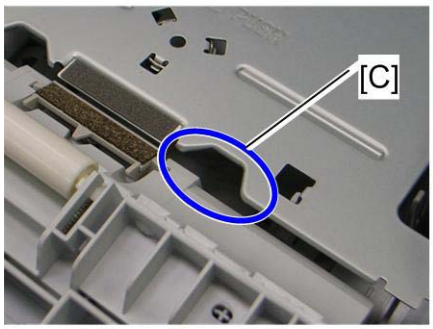

g849d506

There is a paper end sensor [A] in the tray. The feeler [B] drops into the cutout [C] in the bottom plate and the actuator interrupts the paper end sensor. This sensor also detects whether the tray is set.